Plates for Emerywille paper

(1)

Plate I

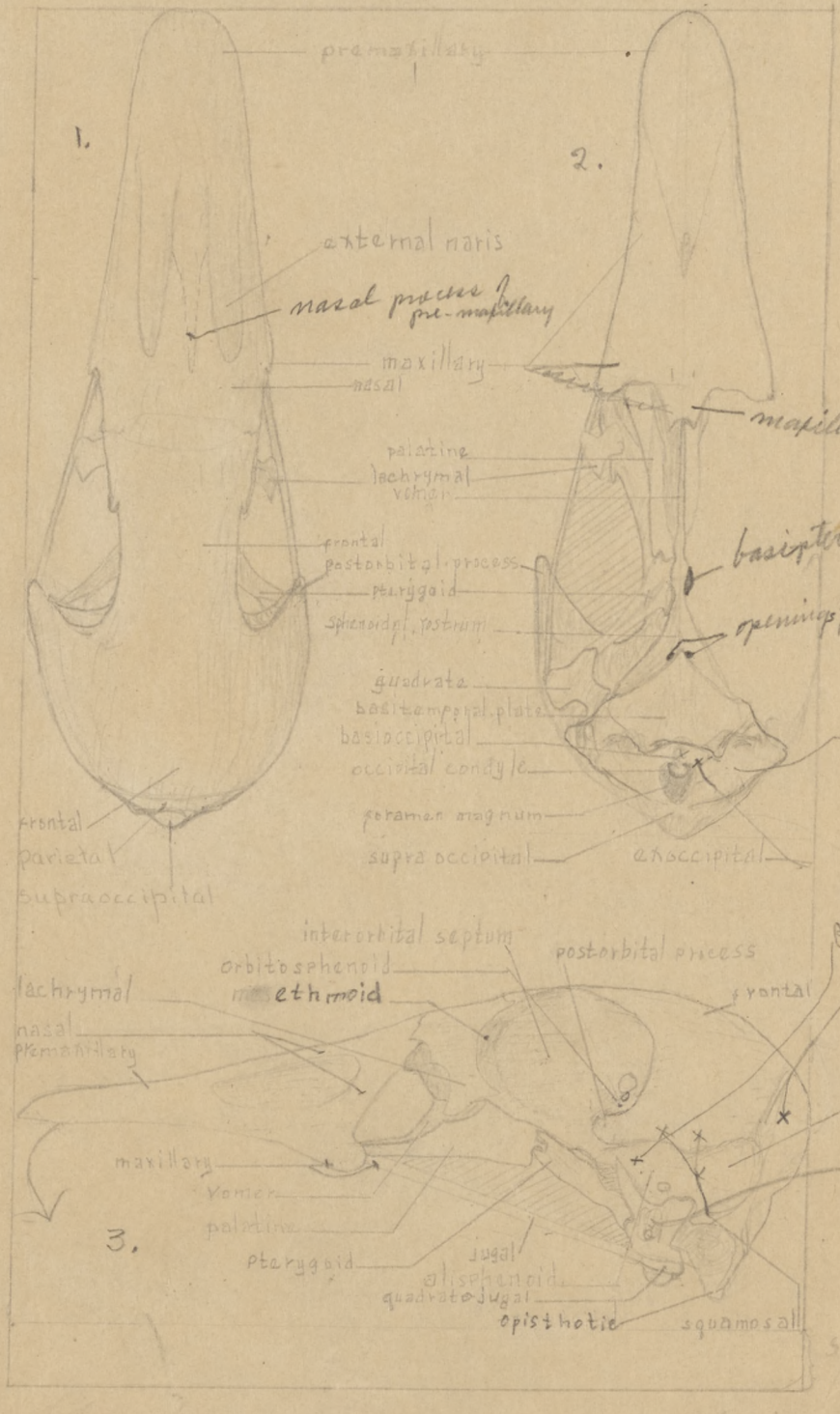
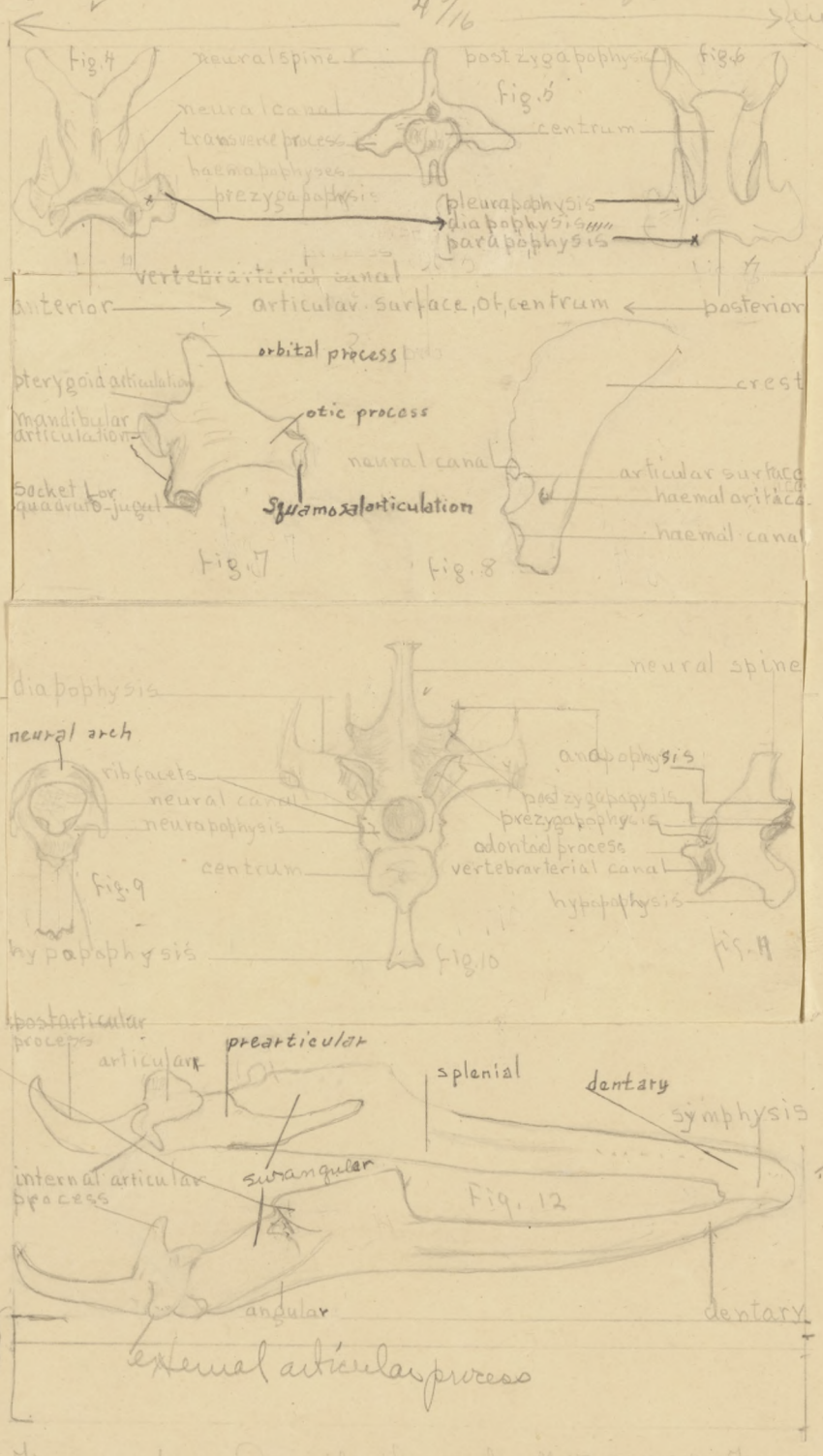


Fig. 1, dorsal view; fig. 2, ventral view; fig. 3, lateral view.

Plate II



Figures 4, 5, 11. Oreolalla chapadmalensis MVZ 28884; fig. 4, 6th cervical vertebra, dorsal view; fig. 5, 5th quadrate, external view; fig. 6, 4th thoracic vertebra, ventral view; fig. 7, atlas, posterior view; fig. 8, 4th thoracic vertebra, anterior view; fig. 9, axis, right side; fig. 10, pygostyle, right side; fig. 11, caudal vertebra, posterior view; fig. 12, Chaetophractus MVZ 22446, mandible. ×1

3,

Plate II ...

4 1/2 5/16 (cut down borders to make plate this width

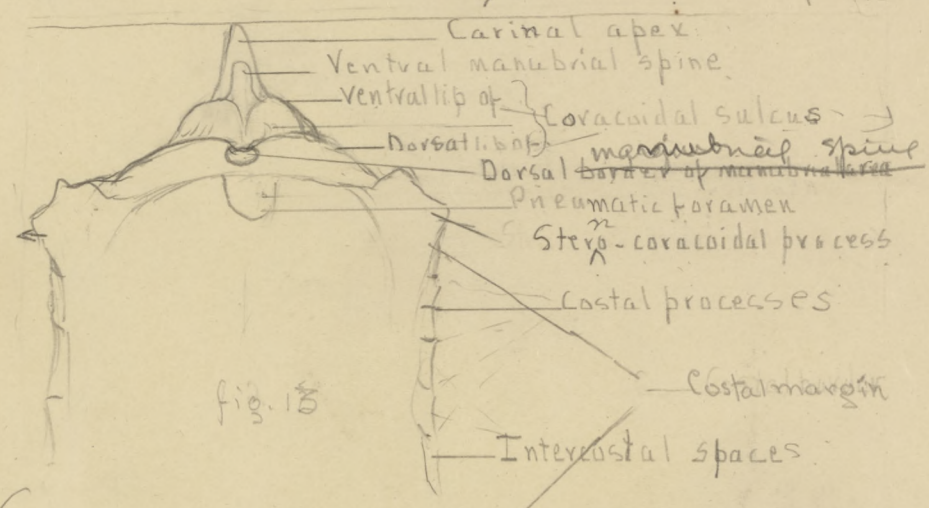


fig. 13

Shorten space in this region to allow for additional bottom

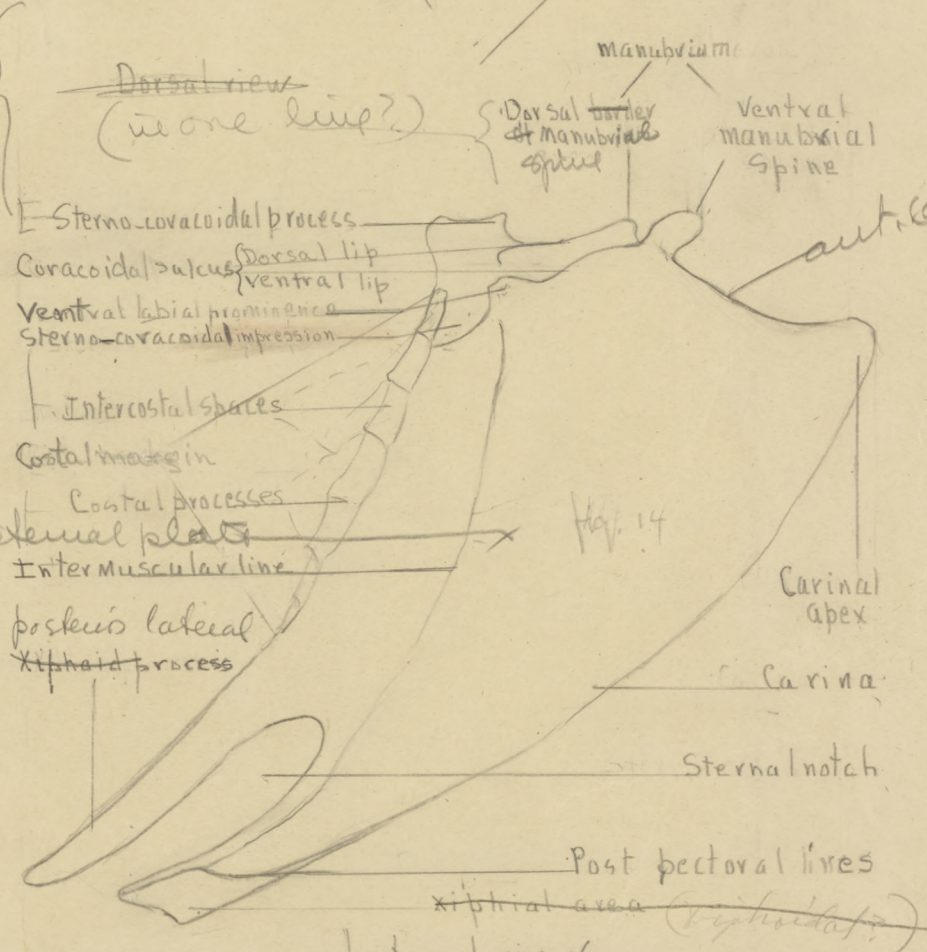


fig. 14

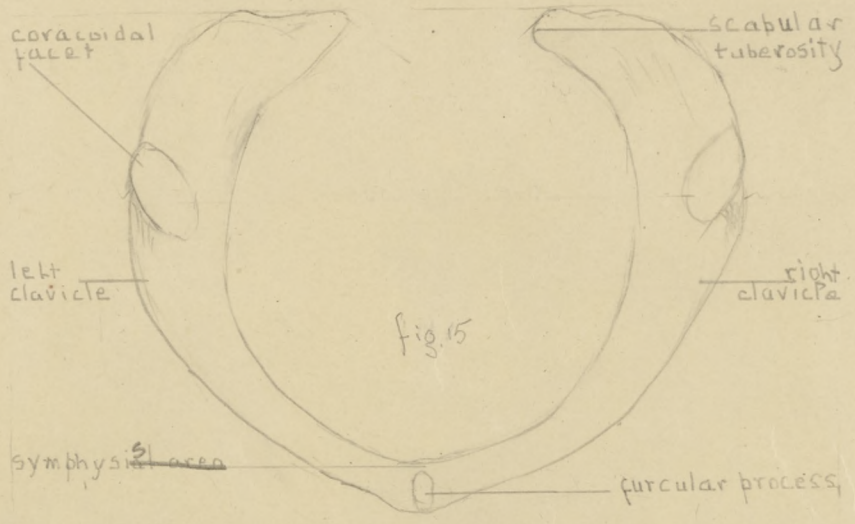
Natural size
Make plate x 2

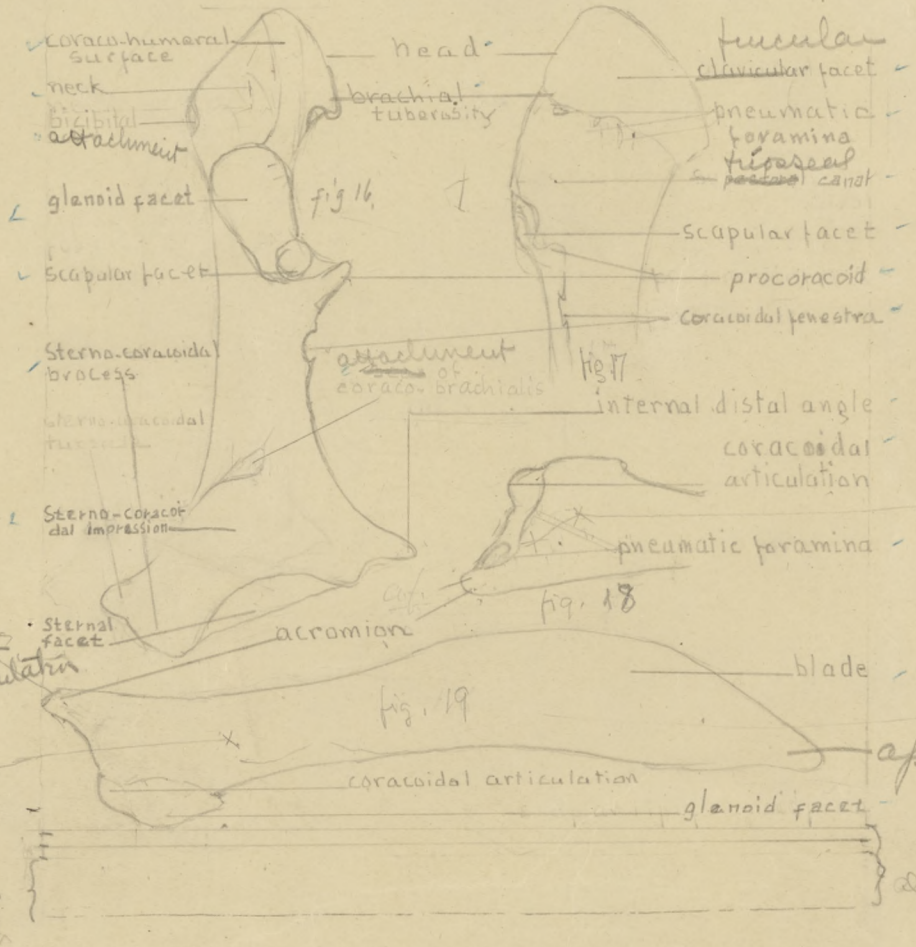
3/16 inch

Sternum of Chen hyperborea.
figure 13 dorsal view;
figure 14 lateral view. X 1

4.

Plate IV





Aquila chrysaetos.

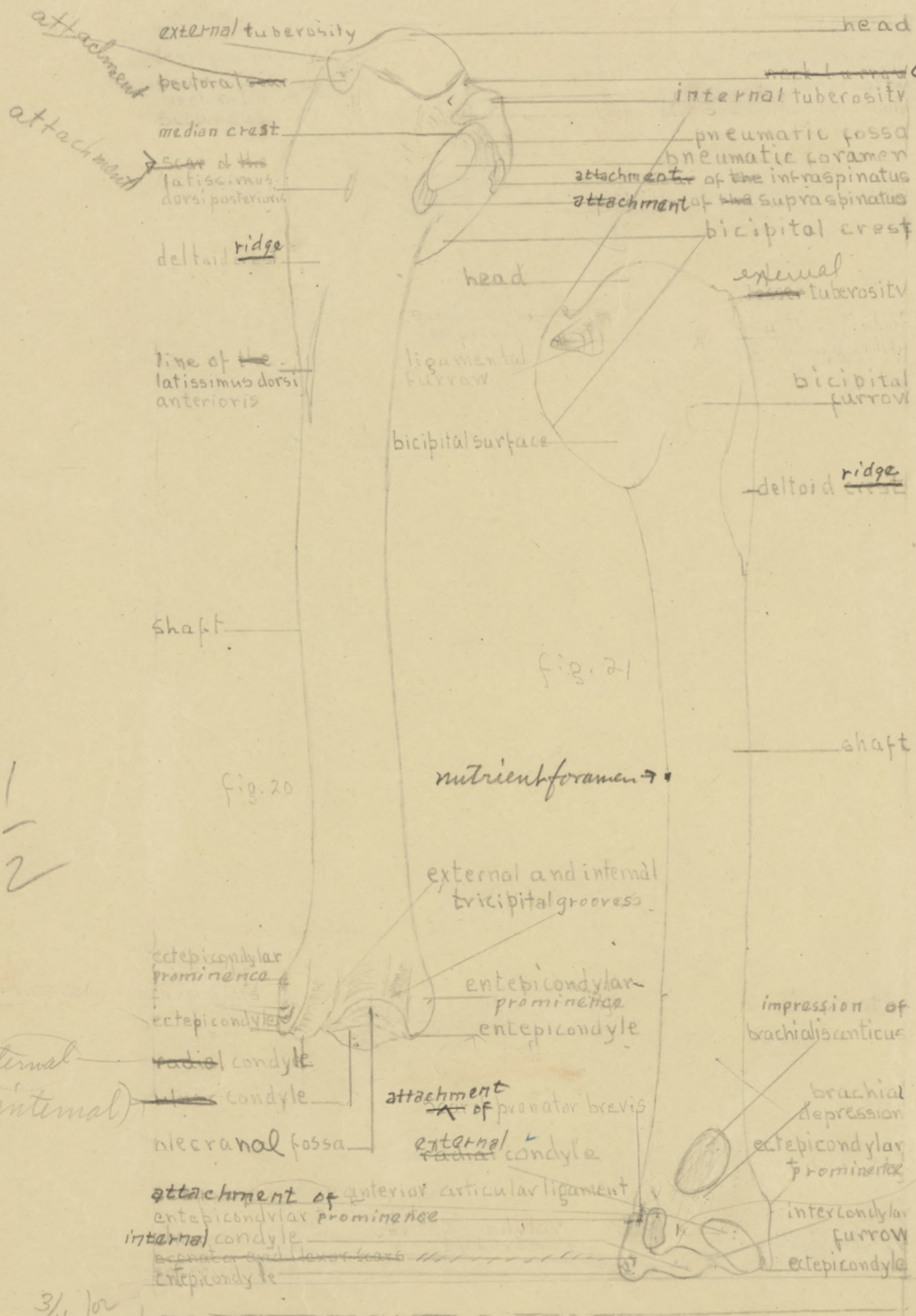
fig. 15 dorsal view of furcula;

fig. 16 dorsal view of coracoid;

fig. 17 internal view of coracoid

fig. 18 ventral view of scapula; (costal face)

fig. 19 dorsal view of scapula, ×1.



Humerus of Ursus hyperboreus.

Fig. 28 posterior view; fig. 21 Palmar view

Plate VI

more drawings up
Toallow 7" at
Bottom for caption
and make plate
7½ inches long

Aquila chrysaëtos. Fig. 22, radius, anconal view; fig. 23 ulna, palmar view; fig. 24 radius, palmar view; fig. 25, ulna, anconal view; fig. 26 scapho-lunar; fig. 27, cuneiform; figs. 22–25 × 2/3; figs. 26 and 27 [illegible] nat. size.

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Plate VII

internal ligamental fossa

anterior carpal fossa

carpal trochlea

ligamental attachment scar of distal radial process

extensor process of metacarpal I

metacarpal I

pollical facet

metacarpal III

metacarpal II

intermetacarpal space

distal metacarpal symphysis

facet for digit III

tuberosity of metacarpal II

facet for digit II

Fig. 28

metacarpal facet

Fig. 30

digital facet

digital facet

Fig. 31

Fig. 32

metacarpal facet

digital facet

Fig. 29

carpal trochlea

external carpal ligamental scar

metacarpal I

flexor attachment

intermetacarpal tuberosity

metacarpal II

metacarpal III

tendinal groove

intermetacarpal space

Fig. 33

tuberosity of metacarpal II

distal metacarpal symphysis

facet for digit II

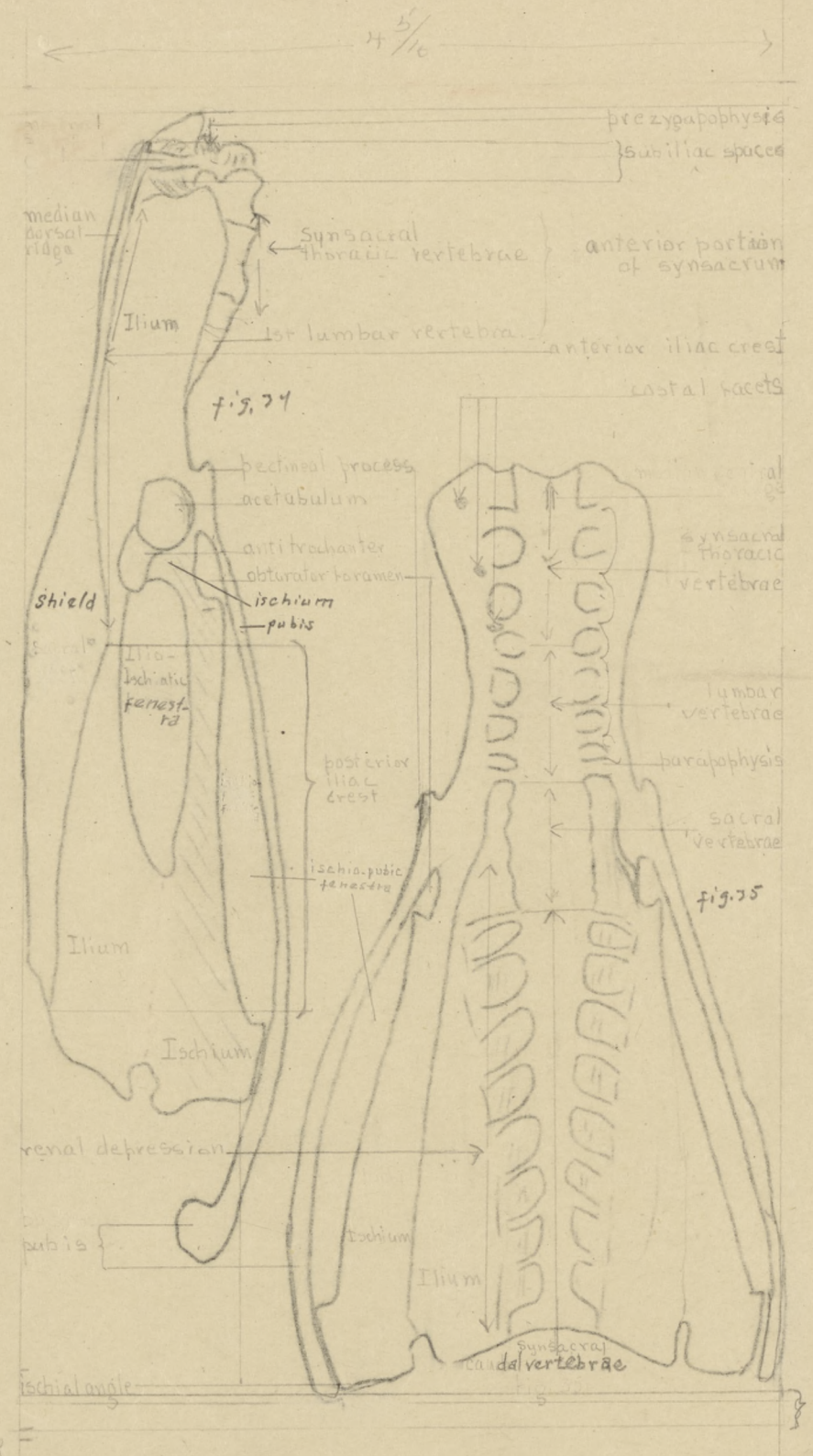
facet for digit III

anterior = toward MI

Fig. 28. carpo-metacarpus, internal view; fig. 29 first phalanx of second digit, external view; fig. 32 second phalanx of second digit, external view; fig. 31 pollex, external view; fig. 30 third digit, external view; fig. 33 carpo-metacarpus, external view.

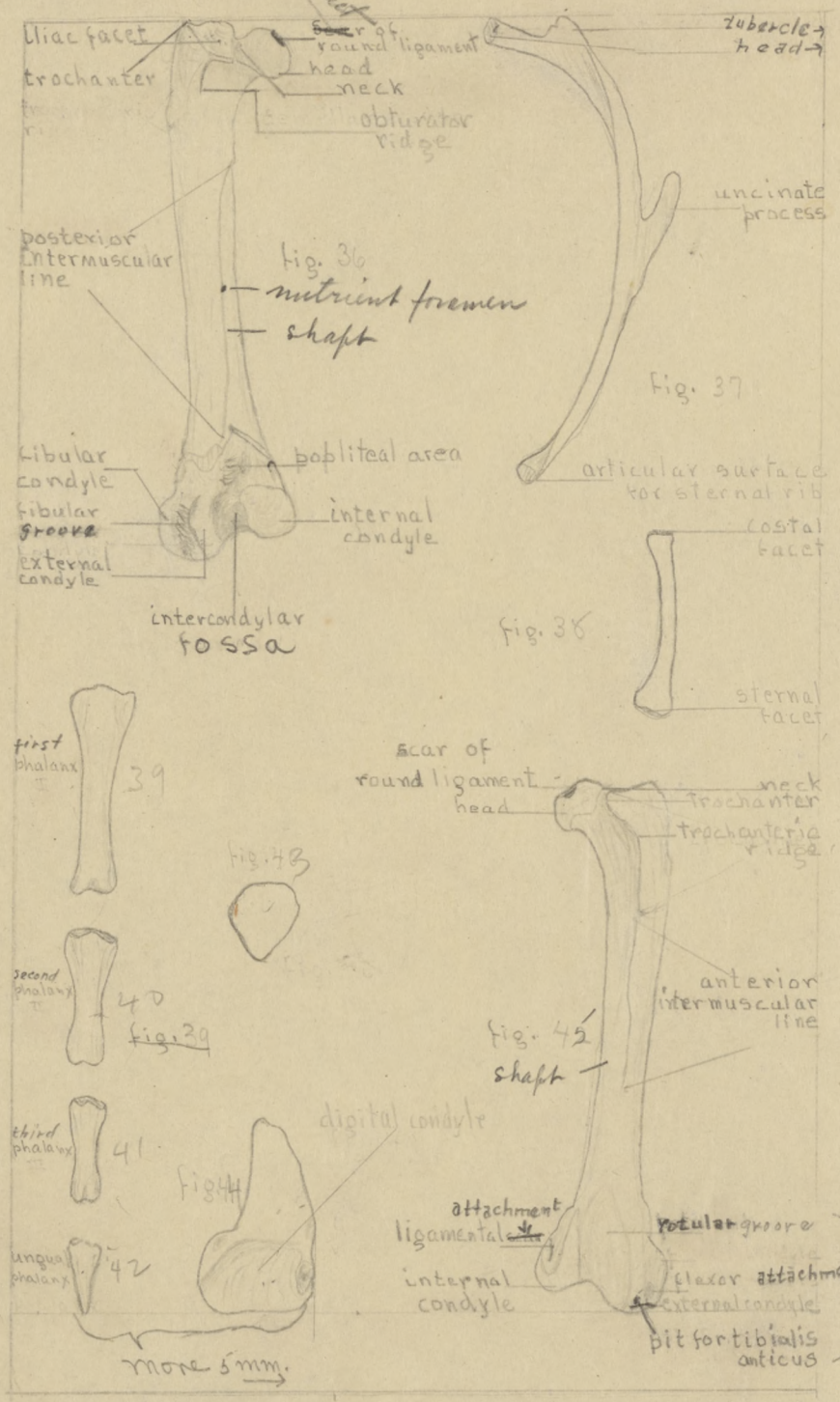
8

Plate VIII



Pelvis of Chen hyperborea.

fig. 34, lateral view; fig. 35 ventral view. X1.



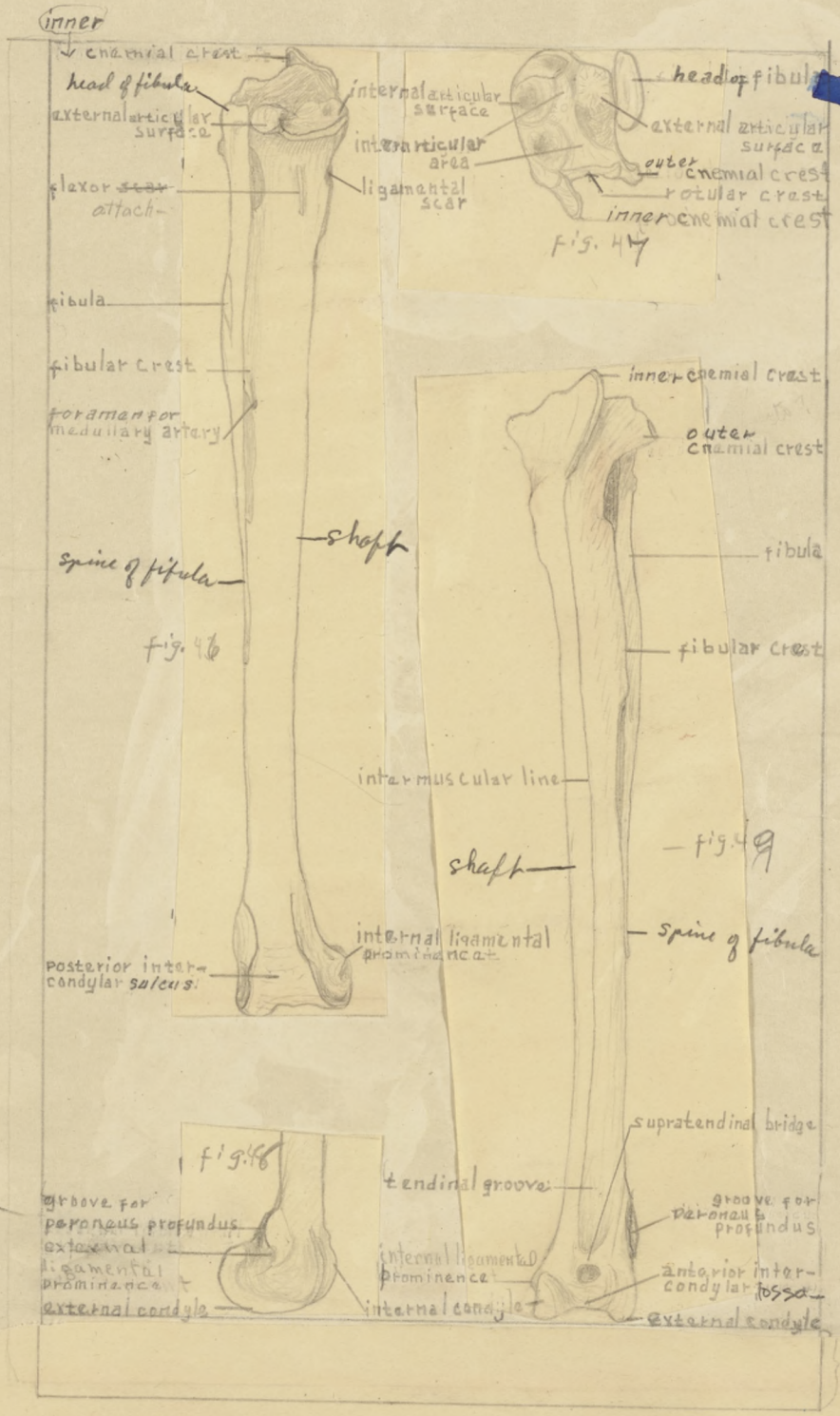
more labels up so lower one is above the line.

fig 36 femur, posterior view; fig 37 rib #4; fig 39 digit III, 4-5

fig 40 patella (Aquila); fig 40 metatarsal I (Aquila);

fig 41 femur, posterior view; fig 42 second rib #4. 233

figures 37, 38, 39, 42 Chen Hypaborecas, 40, 41 Aquila chrysaetos



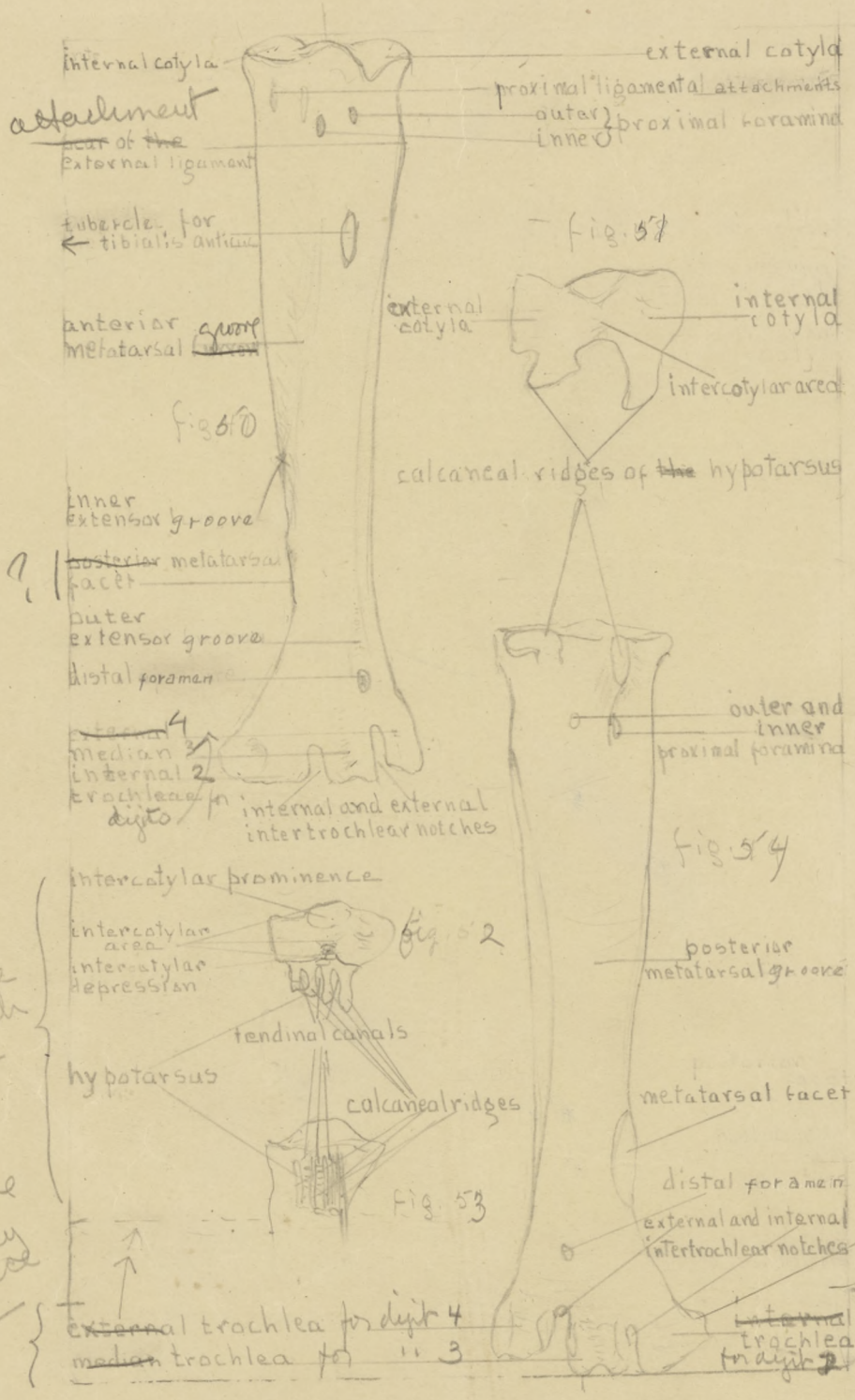
Tibio-tarsus of Chen hyperboreus.

fig. 42 anterior view; fig. 43 external view, distal end
fig. 45 proximal view; , fig. 46
posterior view with fibula attached.

Make twice natural size.

11

Plate XI



Leave these two figures as they are, figure — weather touch Bottom of space More figure #9 up and adjust figure #8 above it spaced equally between top of space and top of figure

wing } trochlea for digit 2

shorten this distance (1/16 inch) for caption.

Sarsometatarsus. Figs. 47 to 49 Aquila chrysaetos; fig. 47 anterior view; fig. 48 proximal view; fig. 49 posterior view. Figs. 50 and 51 Buteo lagopus; fig. 50 proximal view; fig. 51 posterior view. Natural size.

Definitions

Internal
Medial, side toward body of animal

External
Lateral, side away from body of animal

Inner
Of two points on a bone, the one nearer the internal side, regardless of whether or not it is actually en the internal side.

Outer
Same as above, but nearer the external side

Median
In the middle of the bone

Proximal
Superior; end toward body of animal

Distal
Inferior; end away from body of animal

Anterior
Toward the front. head

Posterior
Toward the back tail

Anconal
on the side with the olecranon of the ulna; posterior

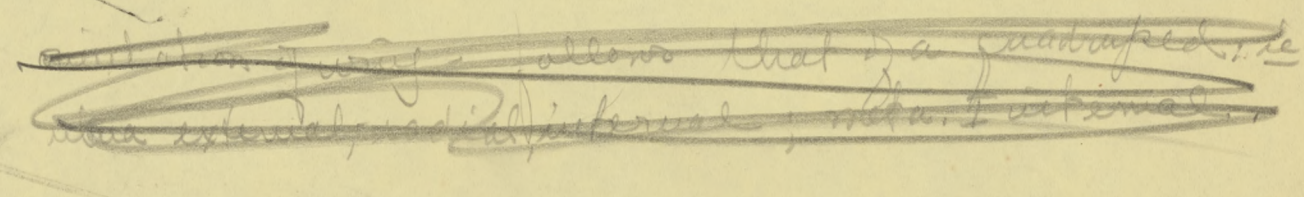
Palmar
Opposite anconal; anterior

Ulnar
Side of wing toward ulna; ~~internal~~ external, or sometimes ventral, posterior

Radial
Side of wing toward radius; ~~external~~ internal, or sometimes dorsal, anterior

Dorsal
Toward the top, or back

Ventral
Toward the ground, or stomach



Definitions

Line

Ridge -- a raised line

Crest -- a higher and more acutely angled raised line

prominences

Process -- a projection

~~Protuberance -- more extended and protruding than a process~~

Tuberosity -- large, rounded prominence, ~~wider than high~~ ?

Tubercle -- Smaller, tho proportionately higher

Papilla -- Very small; a "pimple"

Furrow -- a groove; a long hollow

Sulcus -- ~~a particular~~ more definite than a furrow, i.e. coracoidal sulcus of sternum

Depression -- shallow for width
Fossa -- deeper than the above
Pit -- small and deep
} fairly large

Cotyla -- Cup-shaped cavity, i.e. articular surface of tarsus

Articular surface -- any surface for articulation, the above or:

Facet -- smooth flat, or nearly flat articular surface

Condyle -- an articular prominence, smooth and rounded

Trochlea -- Pulley shaped articular surface, may be of 2 condyles

Attachment -- small surface (area) or attachment of a muscle or ligament

? Surface -- larger area of attachment of muscle (i.e. brachialis antius of ulna)

Imprint -- large surface where muscle or ligament actually attaches

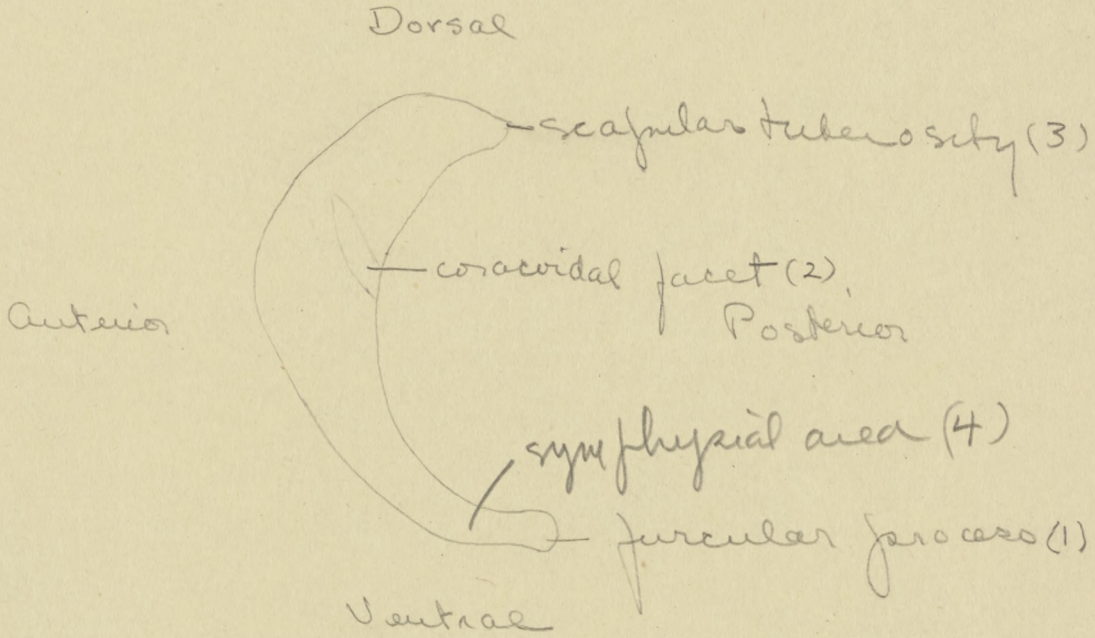
Impression -- an indented imprint

Area -- any other undefined space

~~Scar -- small surface where muscle or lig. actually attach~~

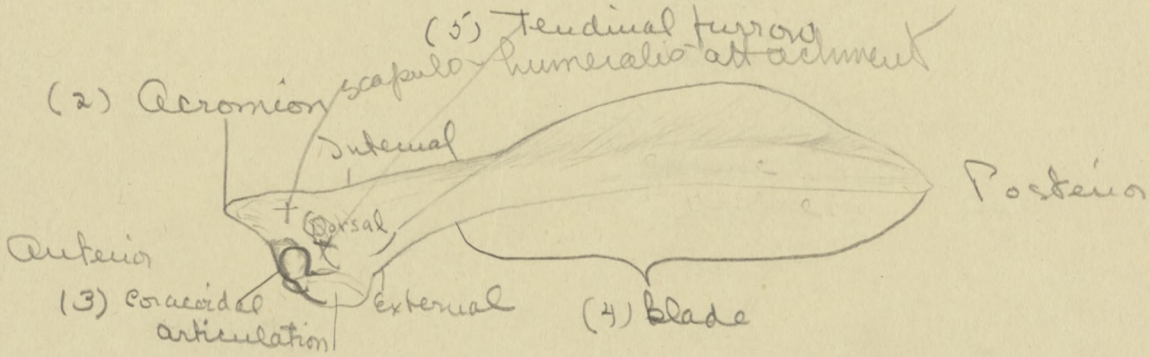
Do not use scar use attachment

Furcula



External view

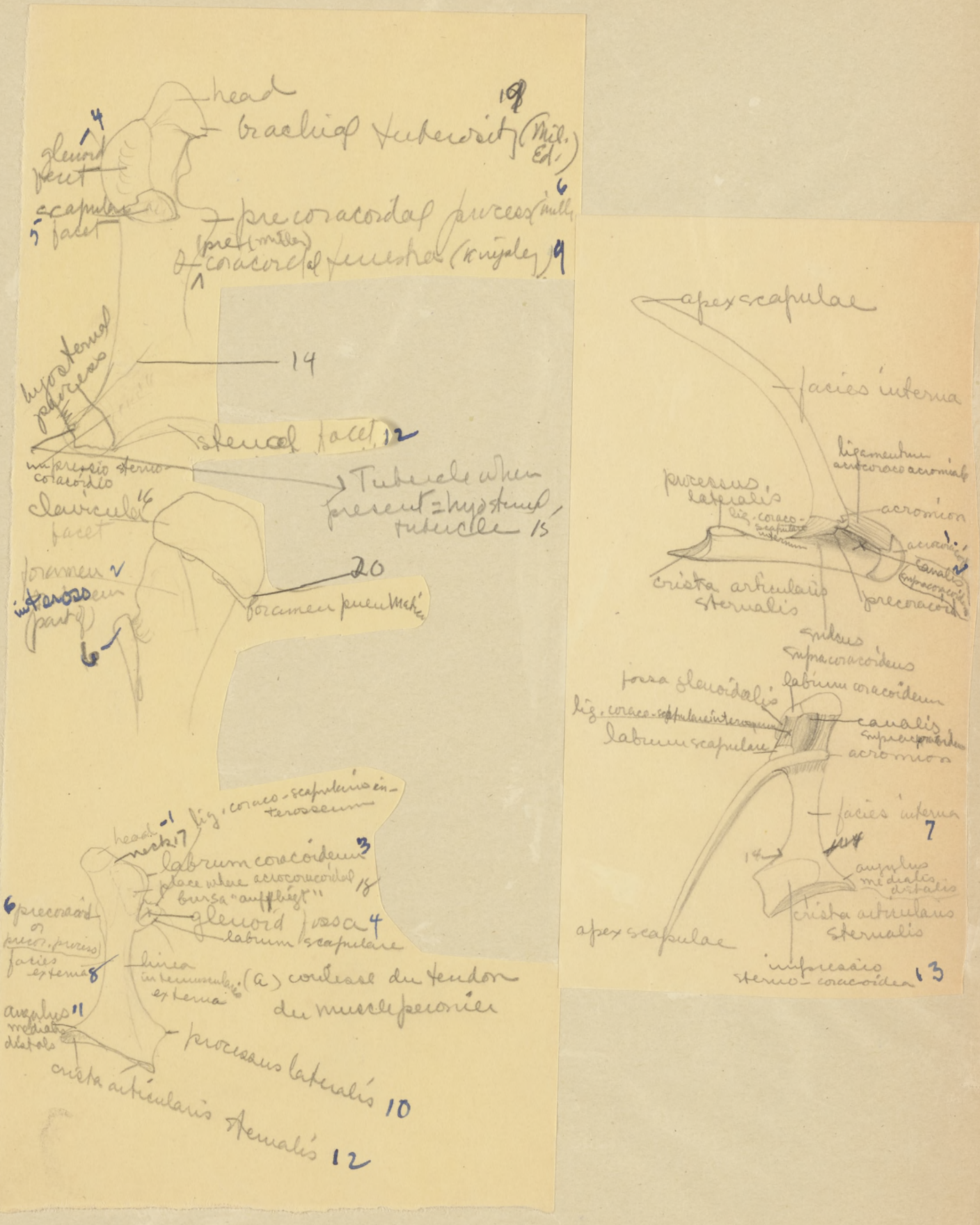
Scapula

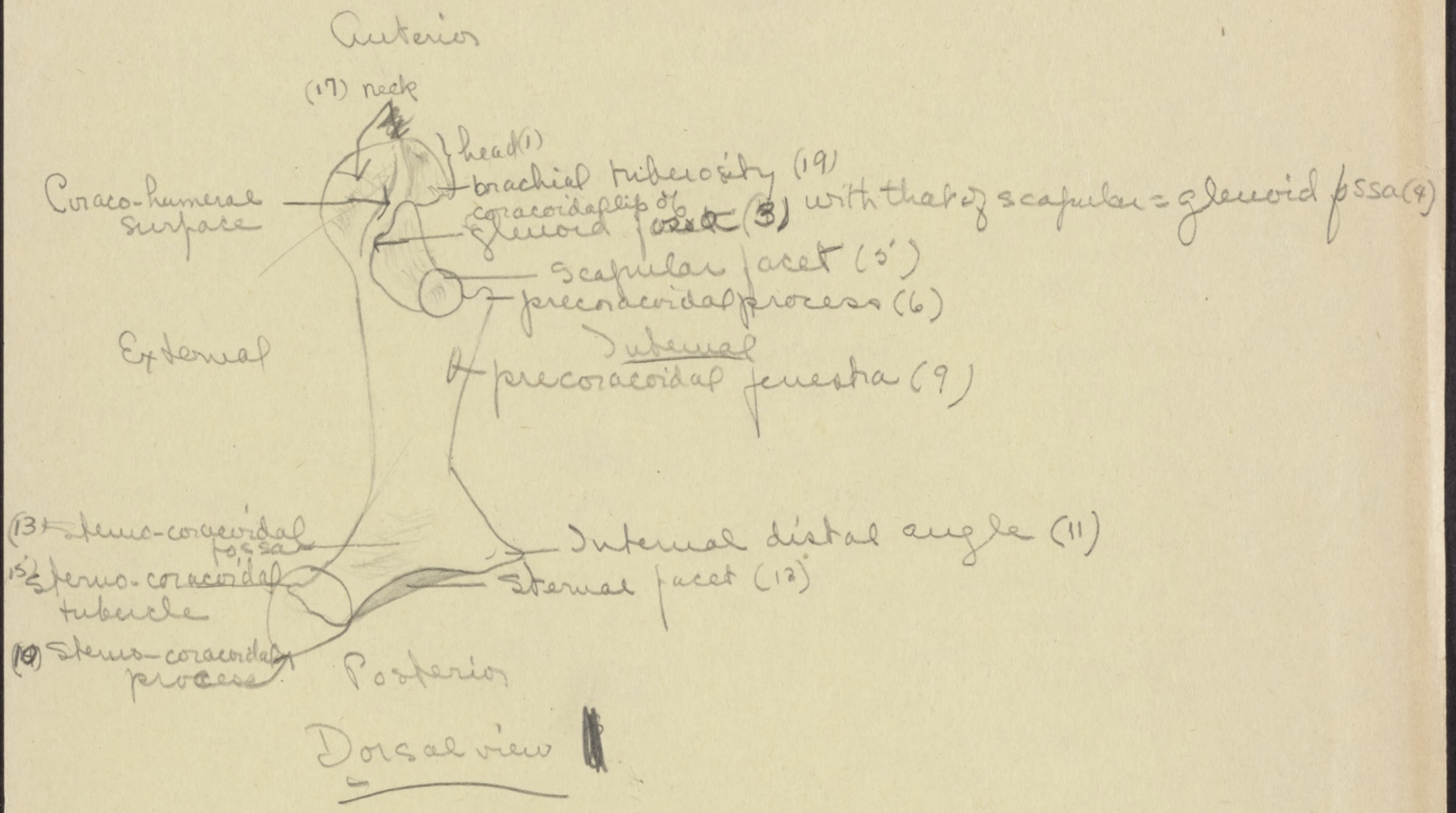


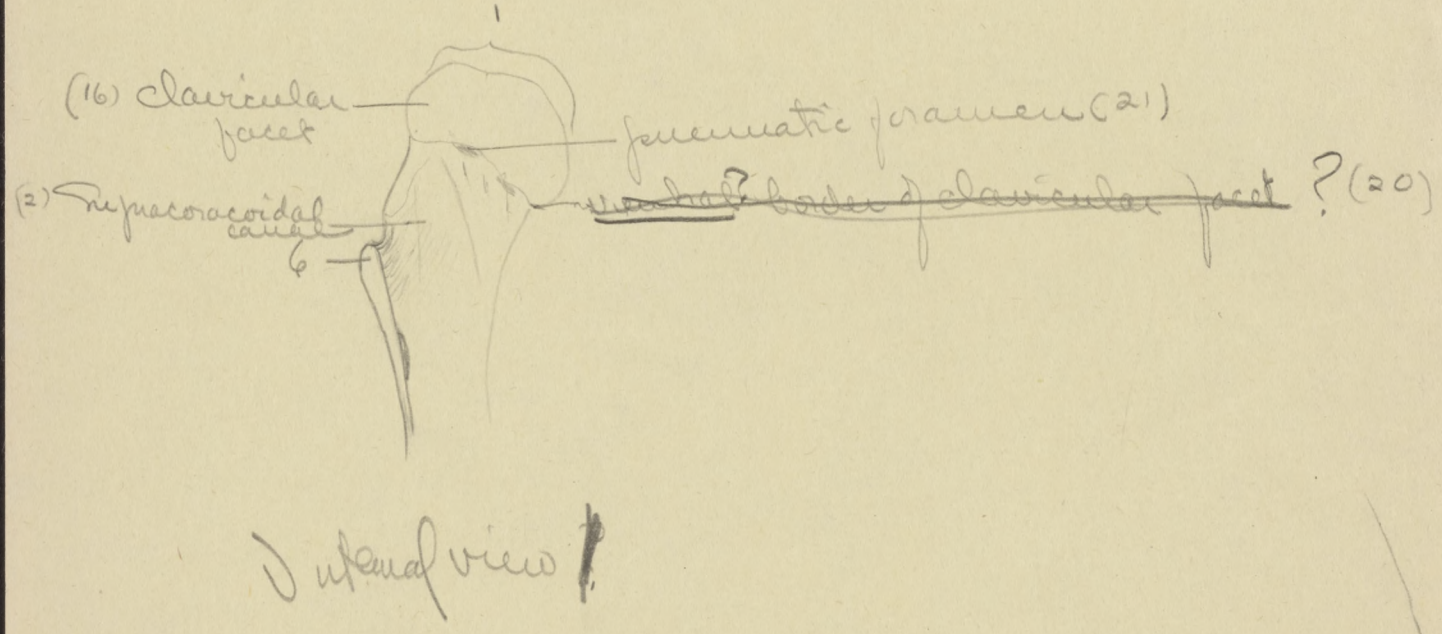
Dorsal ~~(anterior) and~~

~~External (posterior)~~ view

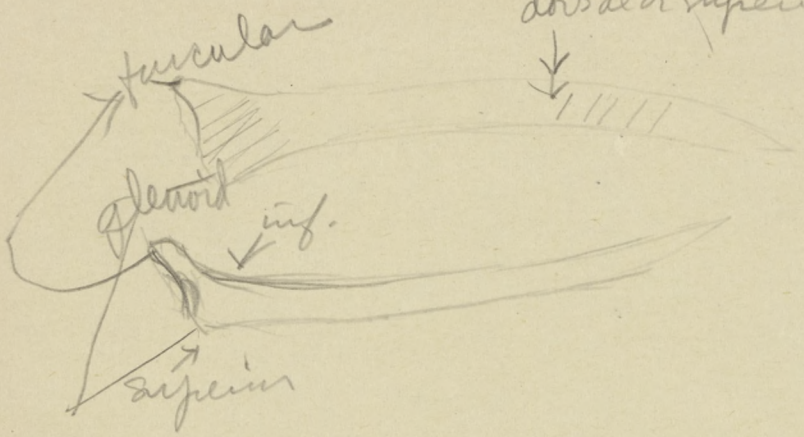
pectoralis 3 to int. tub. of humerus
pectoralis 2
sternocoracoideus onto back of coracoid in lig depressor
pectoralis major overlies the two pectorals and ext over rib. Rip attachment along heel line parallel post. border. Also on each clavicle


head
glenoid facet
scapular facet
brachial tubercle (Mil. Ed.)
precoracoidal process (milky)
coracoidal process (knuckle)
hyposternal process
sternal facet
impressio sterno coracoidea
clavicular facet
Tubercle when present = hyposternal tubercle
foramen interosseum part
foramen pneumaticum
head
neck
lig. coraco-scapulare interosseum
labrum coracoideum
place where acrocoracoidal bursa "auftritt"
glenoid fossa
labrum scapulare
precoracoid or precor. process
facies externa
linea intermuscularis externa
(a) coulisse du tendon du muscle coracien
angulus mediatus distalis
processus lateralis
crista articularis sternalis
apex scapulae
facies interna
ligamentum acrocoraco acromiale
processus lateralis
lig. coraco-scapulare internum
acromion
canalis supracoracoideus
crista articularis sternalis
sulcus supracoracoideus
labrum coracoideum
fossa glenoidalis
lig. coraco-scapulare interosseum
canalis supracoracoideus
labrum scapulare
acromion
facies interna
angulus mediatus distalis
crista articularis sternalis
apex scapulae
impressio sterno-coracoidea


Anterior
(17) neck
head (1)
brachial tuberosity (19)
Coraco-humeral surface
coracoidal lip of glenoid facet (3)
with that of scapular = glenoid fossa (4)
scapular facet (5')
precoracoidal process (6)
External
Internal
precoracoidal fenestra (9)
(13) sterno-coracoidal fossa
Internal distal angle (11)
(15) sterno-coracoidal tubercle
sternal facet (12)
(14) sterno-coracoidal process
Posterior
Dorsal view

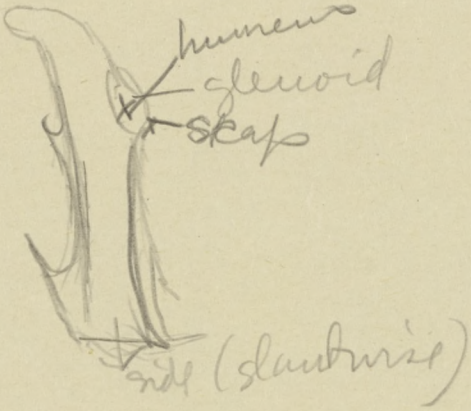

(16) clavicular facet
pneumatic foramen (21)
(2) supracoracoidal canal
~~ventral border of clavicular facet~~ ? (20)
Internal view

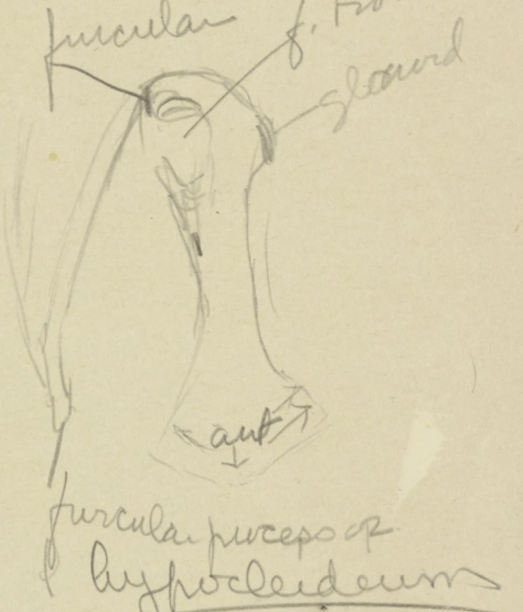
Scapula

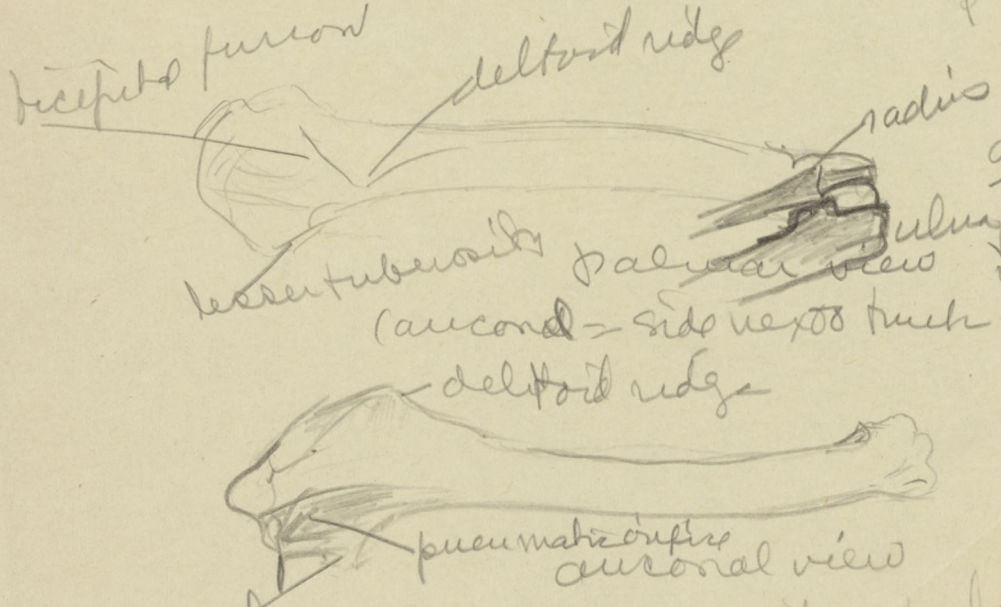


/ = slight tilt
/// = almost horiz.

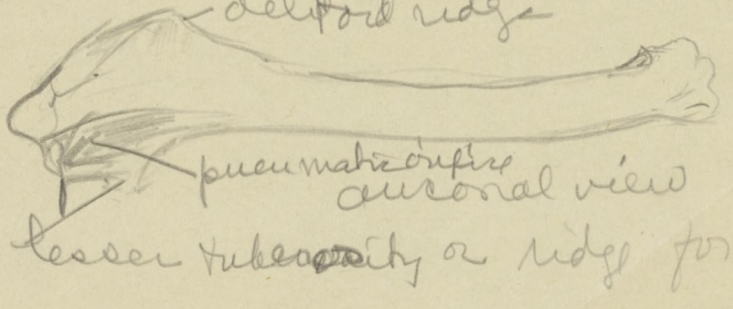
(foramen in trunk
on dorsal or sup = side)



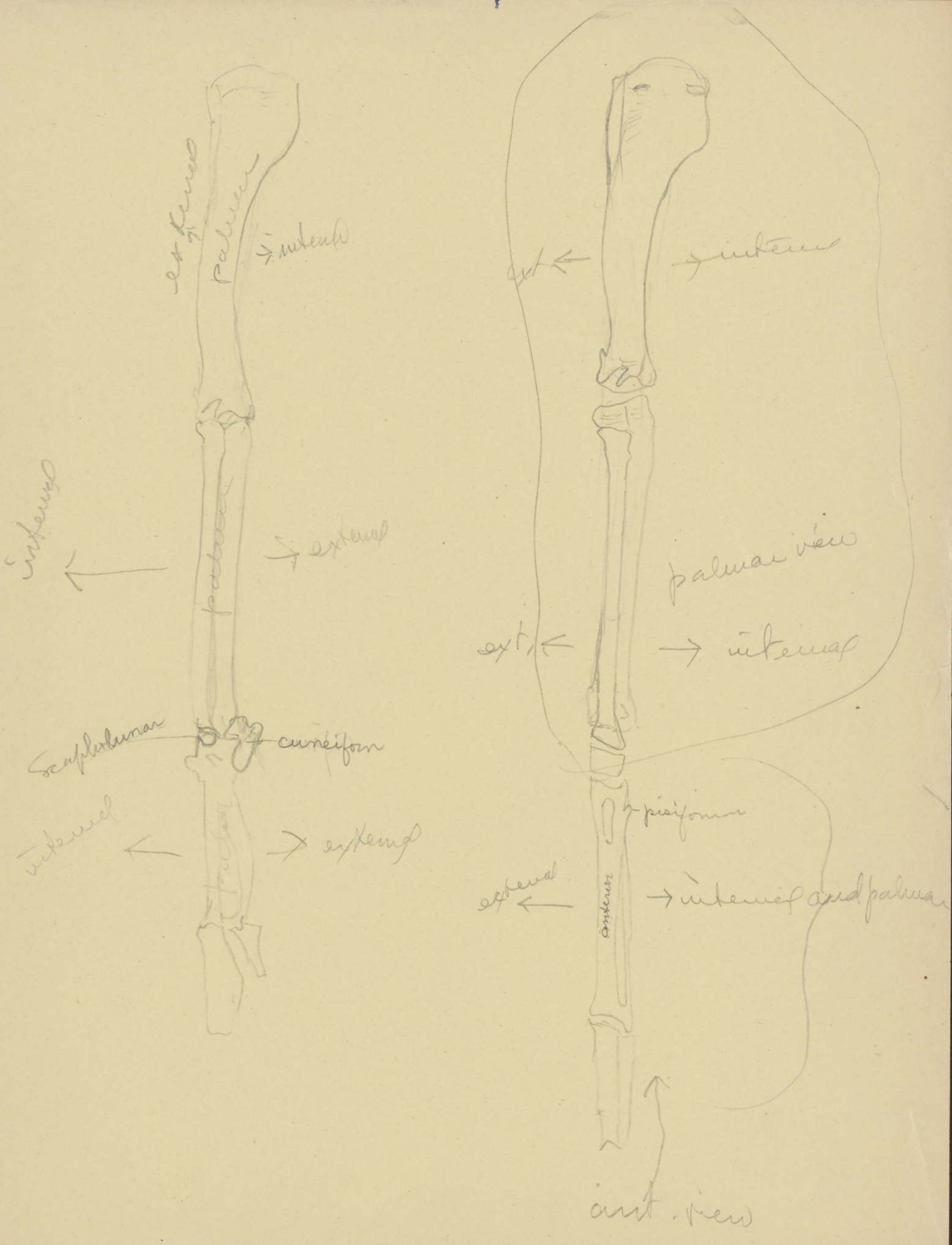


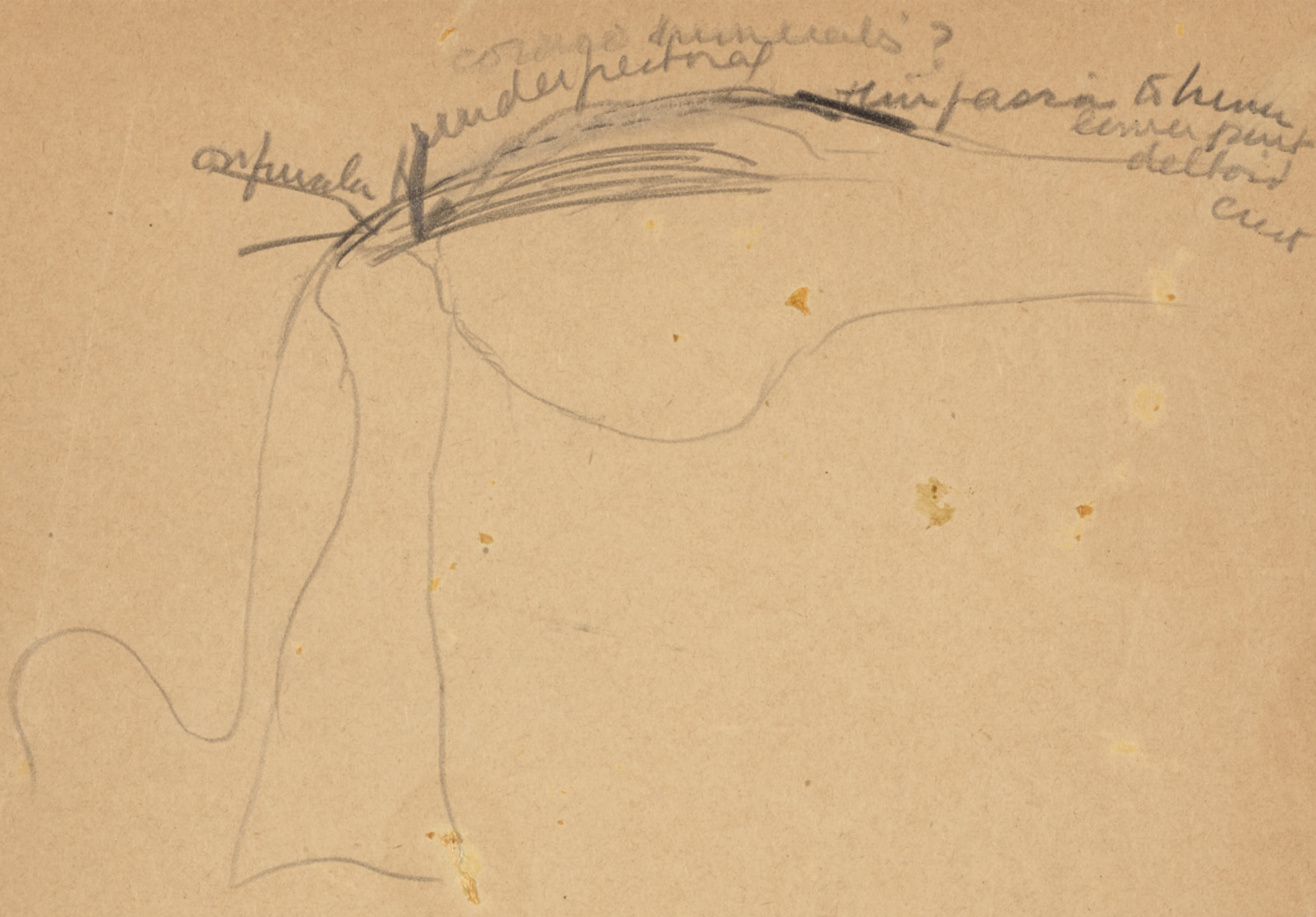


dorsal = radial
ventral = ulnar



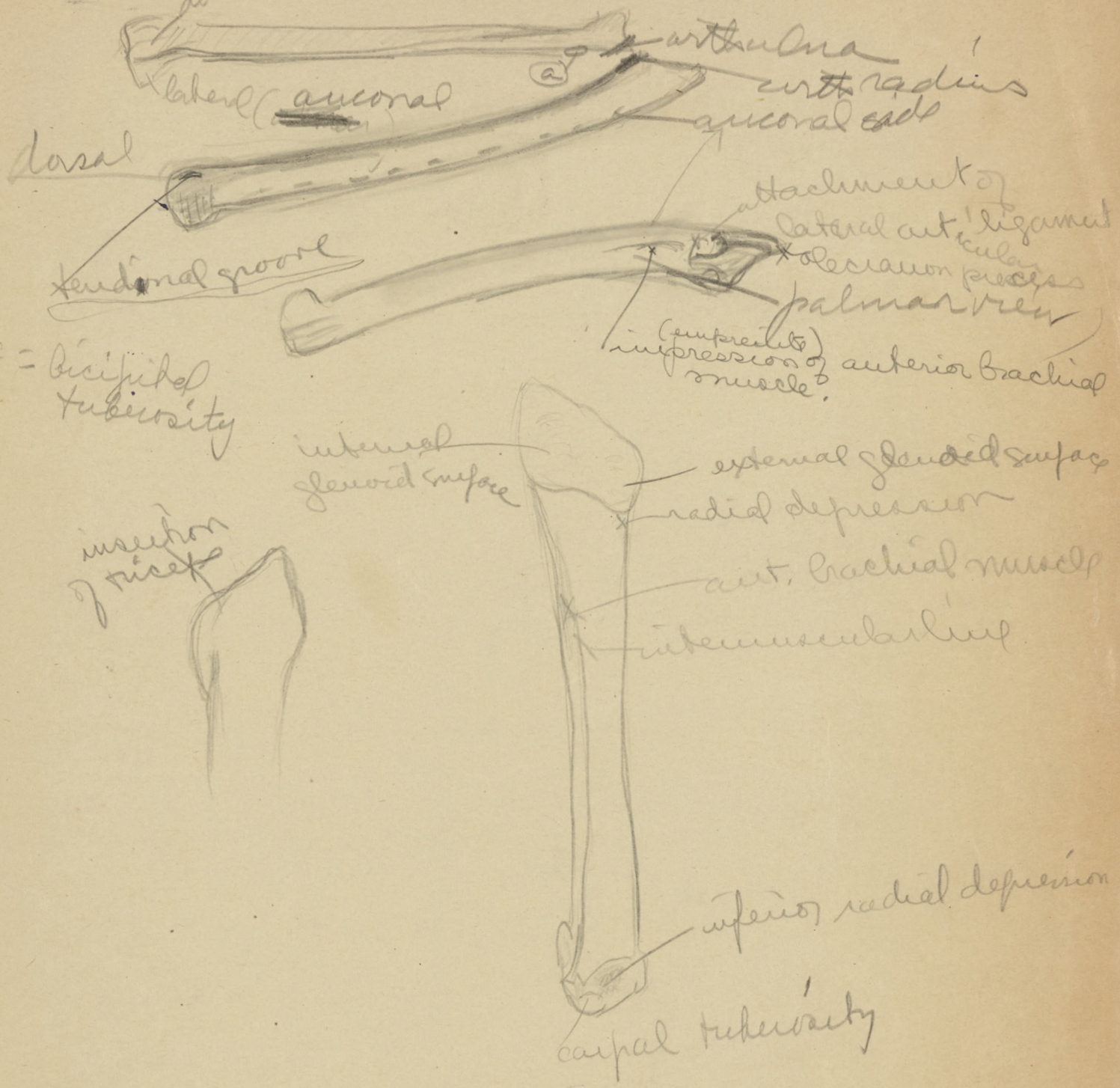
dorsal = radial
ventral = ulnar


ext
radius
interne
interne
extern
scapholunar
cuneiform
interne
externe
ext
interne
palmar view
ext
interne
pisiform
external
interne and palmar
anterior
ant. view


axillaris
pectoralis
deltoid

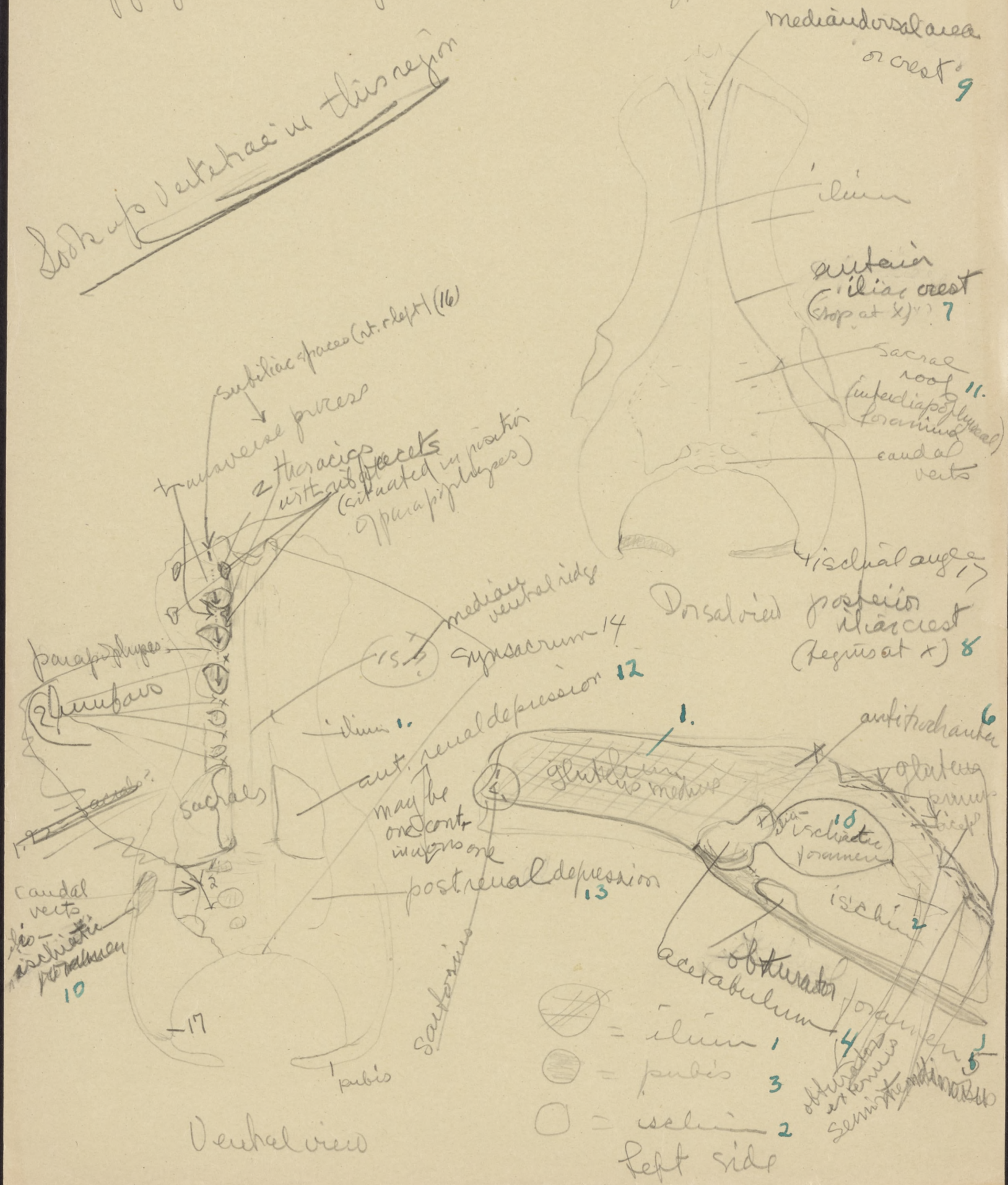
radius = radial + anconal

dorsal = radial



Parapophysis = below trans. process — some sacrals vary from 1 to 5

Look up Vertebrae in this region



	Leg bones	Wing bones	Carpo-metacarpus	Coracoid	Scapula	Furcula
End	Proximal	Proximal	Proximal	Anterior	Anterior	Anterior
End	Distal	Distal	Distal	Posterior	Posterior	Posterior
Face	Anterior	Palmar	~~Palmar~~ radial MI side (~~pisiform side~~)	Ventral	Ventral	Ventral
Face	Posterior	Anconal	~~Anconal~~ ulnar MIII side	Dorsal	Dorsal	Dorsal
Side	External	Radial	~~Radial~~ anconal (~~Thumb side~~)	External	External	External
Side	Internal	Ulnar	~~Ulnar~~ palmar	Internal	Internal	Internal

Unpaired Elements

	Pelvis	Sternum	Furcula
End	Anterior	Anterior	Anterior
End	Posterior	Posterior	Posterior
Face	Dorsal (external)	Dorsal (internal)	Dorsal (internal)
Face	Ventral (internal)	Ventral (external)	Ventral (external)
Side	Right	Right	Right
Side	Left	Left	Left

1. Skull — dorsal, ventral, lateral 1-2

~~2. Mandible - dorsal~~ 3

~~2. Skull - lateral~~ 4

✓ MVZ 22446 Mandible - lateral 28884 40867 40866 (42.1) 5

3. cervicals, quadrate, caudal, pygostyle 6 — 11

✓ 3. Sternum - dorsal, lateral 45555 12 - 13

✓ 4. Furcula - dorsal 28884 14

Coracoid - dorsal 28884 15

" ventral 16

Scapula - ventral 28884 17

" dorsal 18

✓ 5. Humerus - ventral, dorsal, palmar 45555 19-20

6. 28884 Ulna, palmar, ventral, ulnar (dist. end) 21-23

7. aquiles 28884 → Radius, palmar, ventral 24-25

Scaphoidian, cuneiform 26-27

✓ 8. 28884 → Carpo-metacarpus, palmar, ventral 28-29

Wing phalanges

✓ 9. Pelvis, ventral, lateral

✓ 10. 45555 Femur, anterior, posterior 45555

Patella, 28884 metatarsal I, tibs, digit 1 pes 45555

11. Tibio-tarsus, anterior, posterior, proximal 45555 and internal & external sides

✓ 12. Tarso-metatarsus

28884 Aquila - anterior, posterior, proximal.

45555 Chen - posterior, proximal.

five-digit #'s are catalogue nos. in MVZ collection of modern bird skeletons used for Plates published in Ehrenfeld paper

Chen 45555 ✓

Muscles

Tensor patagii longus
clavicular ext. ~~with~~ of coracoid head of clav.
inserts in radial ~~side~~

Tensor patagii brevis
~~internal tubercle of humerus~~ head of clav. with the above
subclavius ~~inserts in prehensile~~ ~~ectepicondylar tubercle~~, below deltoid a ~~fleshy~~ tendon ~~with~~ ext. met. rad. ~~bones~~
coracoid - dorsal side
~~Sterno-coracidal process~~ of sternum

pectoralis major
sternum, clavicle; ~~whole~~ palmar aspect of deltoid crest of humerus

pectoralis secundus
sternum, ~~tendinous~~ expansion bet. coracoid & furcula, thru foramen intersseum
humerus on the lesser tuberosity

pectoralis tertius
pars ~~one~~ <subclavius on sternum - coracoid
humerus ~~ancoral~~ side of greater tuberosity

latissimus dorsi
vertebral spines
humerus on deltoid crest (ant.) and near triceps int. head (post.)

deltoid
below clav. proc. of scap, a ~~clavicular~~ (with ~~tendon~~ patagii) scapular ~~end~~ acromion near scap-humeral
humerus on palmar side deltoid crest, along under head; tendon to bumphere

supraspinatus
~~scapula~~ - ant. dorsal
humerus bet. int. & ext heads of biceps

infraspinatus
posterio-dorsal part of scap
humerus - ancoral side of bicipital crest

subscapularis
antero-dorsal part of scap (under supraspinatus also on ventral side part away under infraspinatus
humerus on greater tuberosity

thoraco-scapularis
scapula - ant. dorsal side on inferior margin bet. portions of subscapularis

triceps
ext. head over anbtrochanteric crest & ~~arises~~ under surface of olecranon of ulna
ext. lined in pneumatic ossa
scapular head - dorsal side scap aut. to supraspinatus, etc., (olecranon proc of ulna, radial side

coracobrachialis
with teres minor to greater tub. of humerus - coracoid - dorsal side middle
coracohumeralis - coracoid above biceps & below lig. - humerus palmar side prox end of bicipital groove
scapulo - humeralis
acromion of scap
humerus

biceps
coracoid - ant. side of head
humerus, bet. subscapularis & infraspinatus on greater tuberosity
teres minor ~~with~~ coraco - brachialis on humerus
ventral side prox end of scap on acromion

1 extensor metacarpi radialis longus
humerus, ectepicondylar tuberosity bet. tensor pat. brevis & deltoid
tubercle on palmar side above radial condyle
metacarpus - tip of MI

2 extprogimus pollicis
ulnar side of fundus of the above
antero-ulnar side of pollex.

3 extensor digitorum communis
humerus below 1
thin groove dist. end of ulna, 1 branch to base pollex,
thin groove contains insertn prox. end of 1st phal. of dig. 2

4. supinator brevis
humerus below 3
radius - anterior side of shaft

5. flexor metacarpi radialis
overlapping 4, on humerus; ulna, olecranon, intermetacarpal tuberosity.

6. pronator brevis
internal condyle of humerus (just outside of lig. scar)
radius - shaft

7. pronator longus
internal condyle of humerus, radius -

8. flexor carpi ulnaris
humerus, internal condyle distally to ulnar
ulna - ulnar side of olecranon

9. anconeus
humerus - ext. condyle below 5 & 4
ulna, radial side under internal cotyla & down shaft

10. ext. ossis meta. pollicis
to M_1. arises in part of greater sigmoid cavity of ulna (with anconeus)

11 ext. indicis longus
on radius
radial groove on ulna

12 flex. digitorum perforatus
ulna, on either side of brachialis anticus to ulnar side of base of dist. joint of index finger

13. flex carpi ulnaris brevis
ulna low part of shaft dist to flex. dig. prof.

14. flex. metacarpi brevis

15. flex. minimi digiti on M_3 below hollow, tendon goes down groove

16 & 17 interosseous dorsalis & interosseous palmaris
intermetacarpal space, attaching to margins of shafts of each M

18.

Sartorius
Tibia, pelvis, thoracic spine
gluteus primus
Pelvis, fascia, tibia (with extensor femoris)
extensor femoris
tibia (see above), femur
gluteus medius
pelvis, femur
Biceps flexor cruris
pelvis (just below gluteus primus and in front of obturator externus
fibula or tuberosity.
semitendinosus
pelvis (below gluteus primus and in back of obturator externus
fund. raphe or many of ac. semitend. with lower point median with median fascia
femoro-caudal
pygostyle - femur (internal to vastus externus)
adductor magnus
pelvis (ischium in front of semimembranosus), femur
semitendinosus
pelvis (ischium posterior portion, under obt. ext.), tibia
adductor longus
attachment to pelvis (ant. to obt. foramen ?), femur
vastus internus
fan inner intermuscular line posterior to meet cruraeus line - on femur
obturator externus
pelvis (iliac fossa), femur
obturator internus
pelvis - inside limit of obt. foramen with gemellus to ant. ridge of femur
gemellus
pelvis - space above obturator foramen with tendon to femur.
accessory semitendinosus —
femur

peroneus longus

procnemial crest (fibular process of tibia) to tibial cartilage & hypotarsus (below extensor pedis)

tibialis anticus

femur (just ex. to ext. condyle) tibia (fibular process) to tarsus (common tendon to papilla for Fib. ant. on tarsus)
tibia (ant. part of fibular crest on side below peroneus longus)

gastrocnemius

tibial head (distal to sartorius on inner side of tibia)
internal head (inner condyle of femur with ad. magnus)
external head (fibular condyle of femur)

tibialis posticus or peroneus profundus

fibula and tibia on outer side, goes thru groove on outer side of tibia
tibia on edge external cotyla

flexor perforatus indicis secundis pedis

inter surface of external condyle of femur very near ext. gastrocnemius
thru hypotarsus to phal. 2 of digit 2

flexor perforatus medius secundis pedis

femur on ext. condyle with and superficial fascia of knee joint
fibula dist. end tibia below this, thru hypotarsus to phal 2 of dig. 3 (middle one)

flexor perforatus annularis primus pedis

~~from middle of flexor longus hallucis~~ to intercondylar notch of femur
under side of astragalus

flexor longis hallucis

femur ext. condyle and intercondylar notch

flexor perforatus medius primus pedis

femur intercondylar notch

flexor perforatus indicis primus pedis

femur - ext. condyle under longis hallucis

flexor perforans digitorum profundus

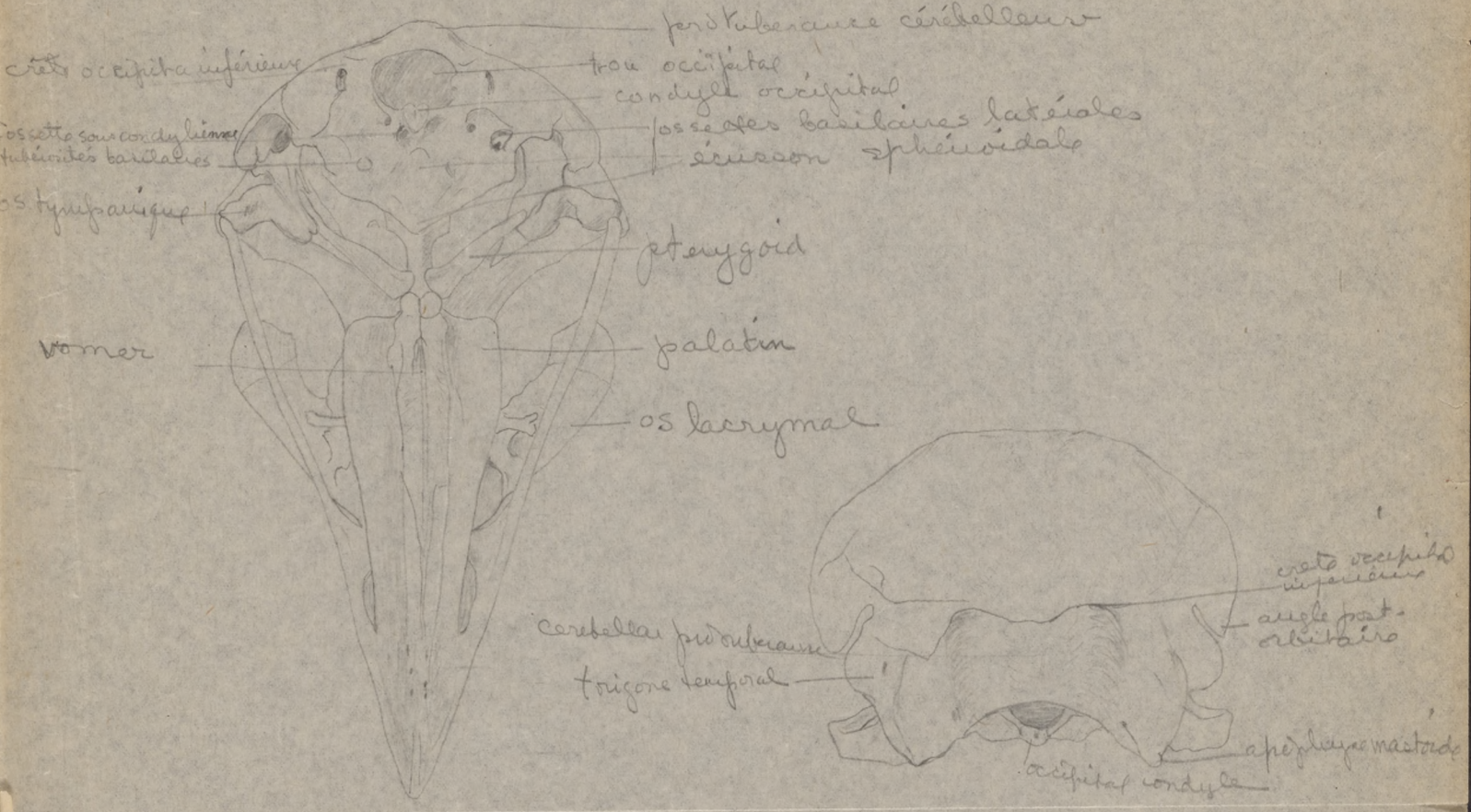
femur with longis hallucis
all 3 toes to unequal to process on prox. end.

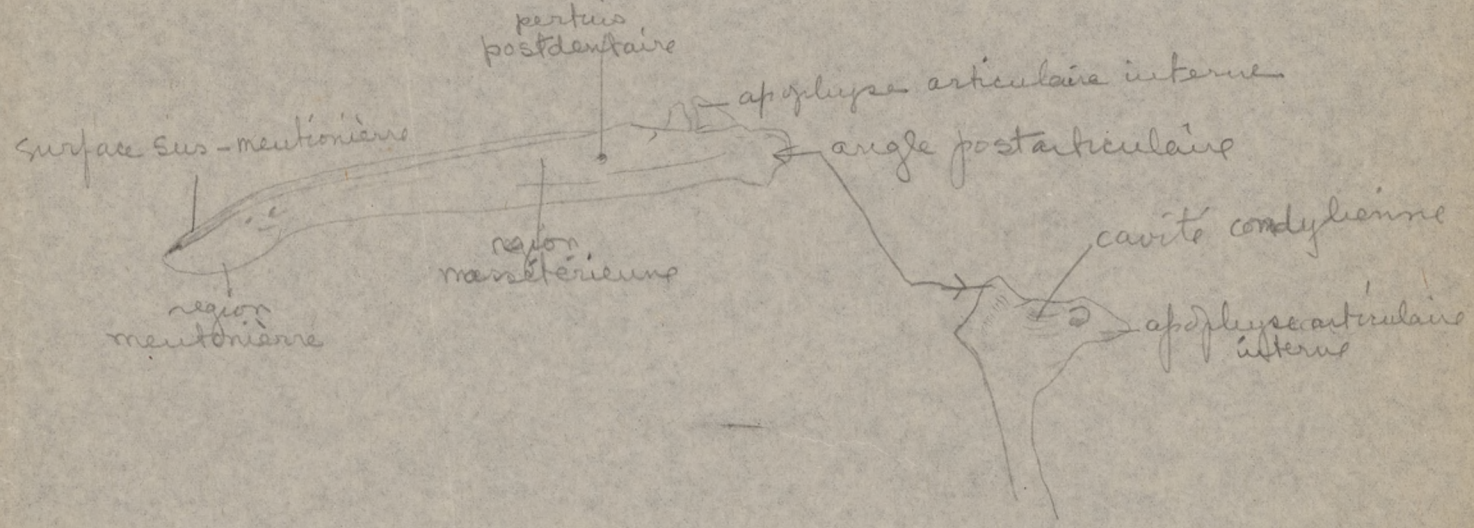
extensor longus digitorum

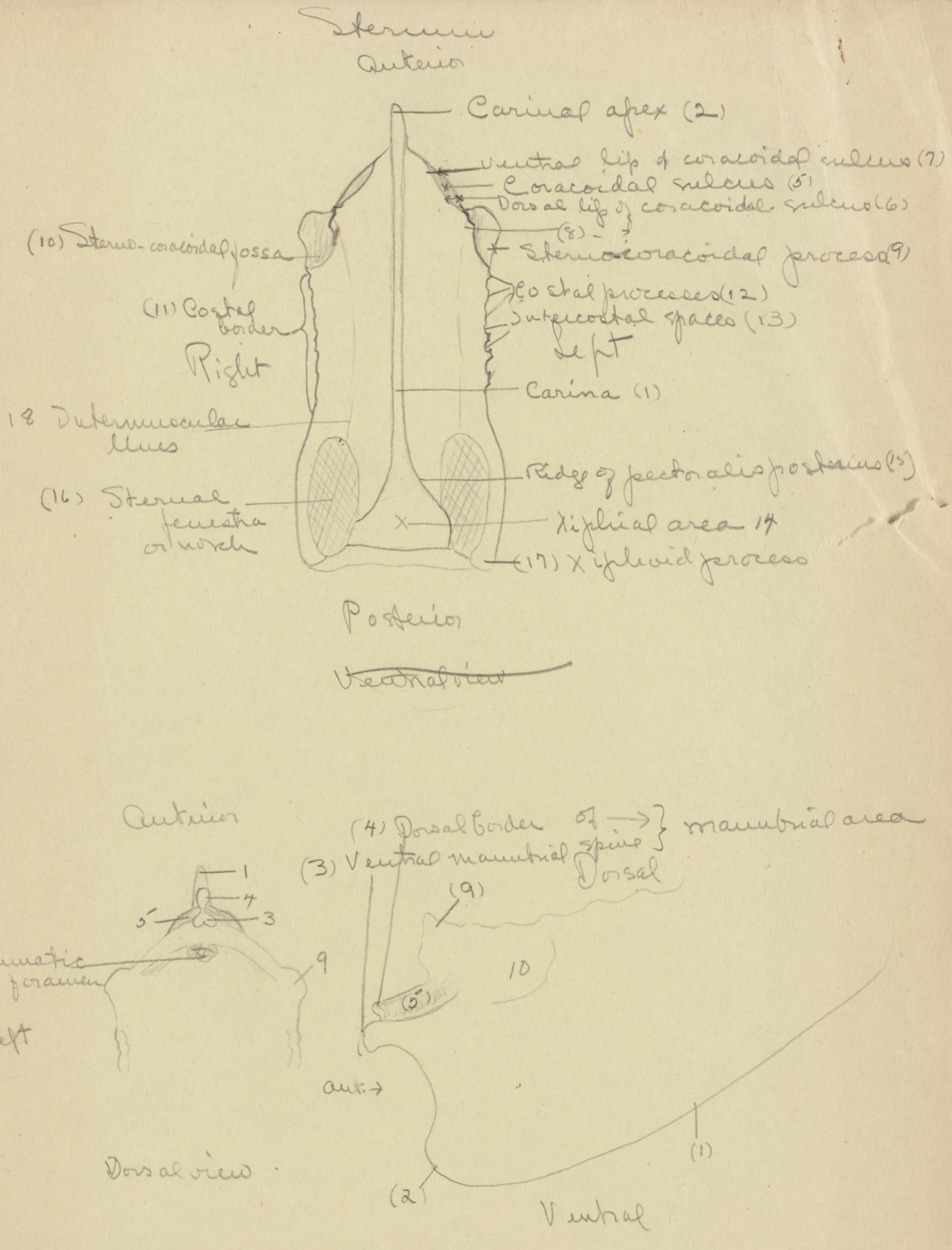
tibia in front thru bony bridge
all three toes " " "

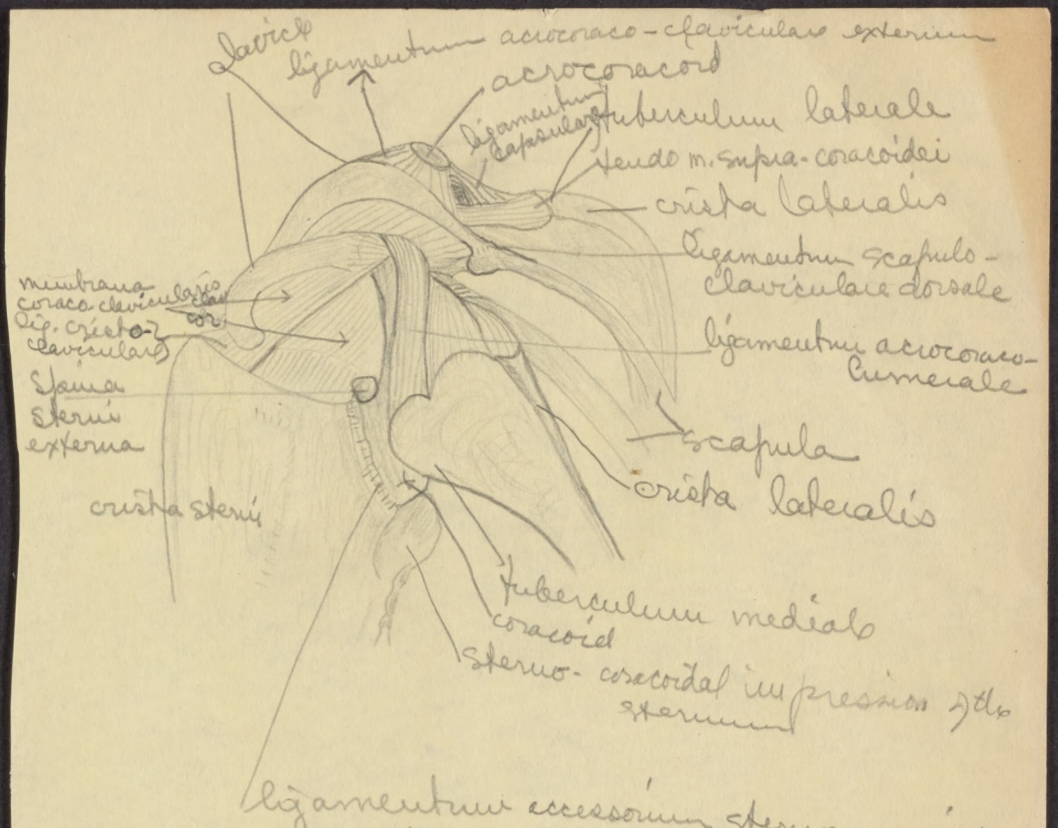
extensor hallucis brevis

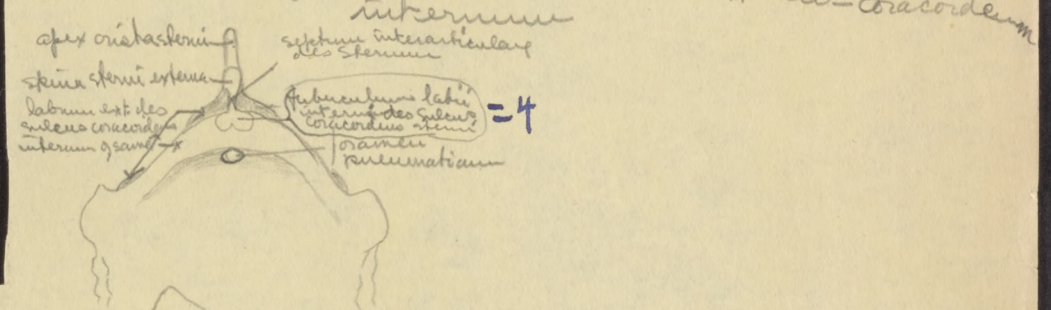
tendon ant. portion of tarsus

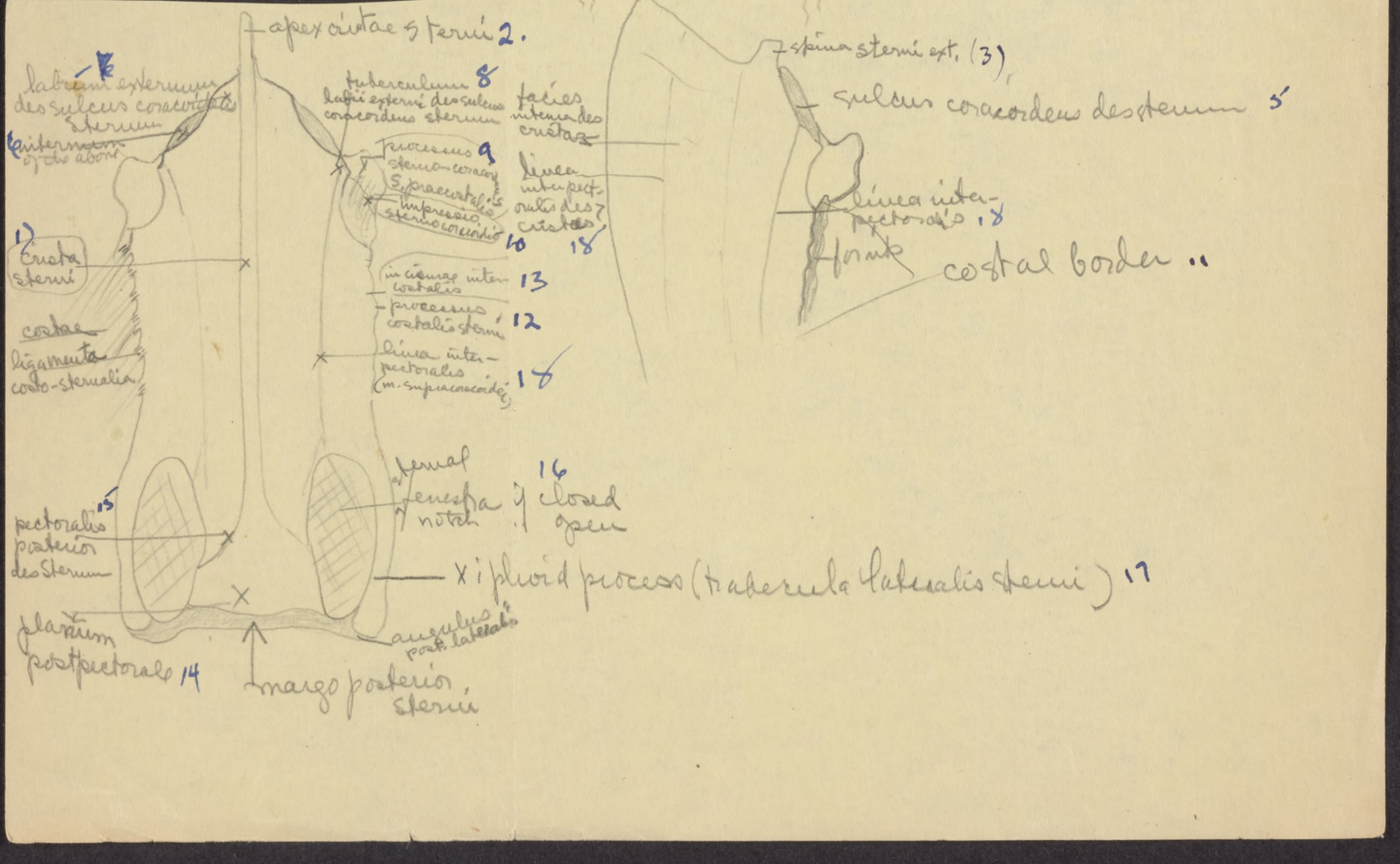

fer à tubercules cérébelleux
crête occipitale inférieure
trou occipital
condyle occipital
fossettes sous condyliennes
tubérosités basilaires
fosses latérales basilaires
échancrure sphénoïdale
os tympanique
ptérygoïd
vomer
palatin
os lacrymal
crête occipitale supérieure
angle post-orbitaire
cérébelleux protubérance
trigone temporal
apophyse mastoïde
occipital condyle

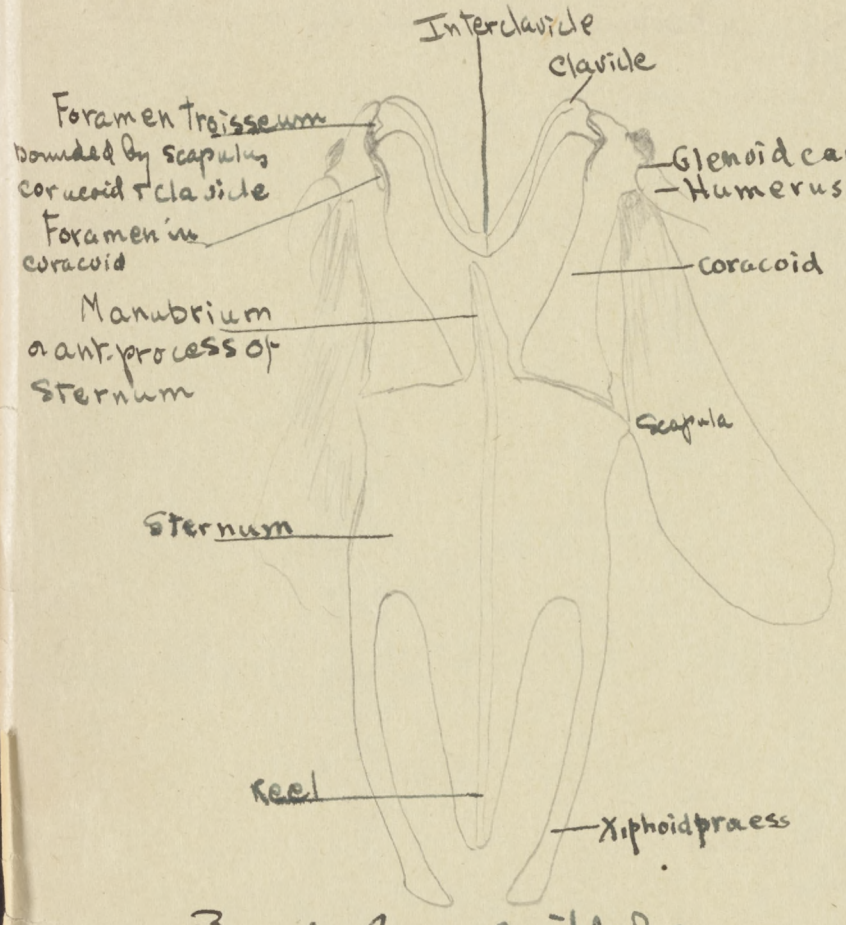

pertuis postdentaire
apophyse articulaire interne
surface sus-mentonière
angle postarticulaire
cavité condylienne
région massétérienne
région mentonnière
apophyse articulaire externe


Sternum
Anterior
Carinal apex (2)
Ventral lip of coracoidal sulcus (7)
Coracoidal sulcus (5)
Dorsal lip of coracoidal sulcus (6)
(8)
Sterno-coracoidal process (9)
Costal processes (12)
Intercostal spaces (13)
Left
(10) Sterno-coracoidal fossa
(11) Costal border
Right
Carina (1)
18 Intermuscular lines
Ridge of pectoralis posticus (15)
(16) Sternal fenestra or notch
Xiphial area 14
(17) Xiphoid process
Posterior
Ventral view
Anterior
(4) Dorsal border of manubrial area
(3) Ventral manubrial spine
Dorsal
(9)
10
(5)
1
4
5
3
Pneumatic foramen
9
Left
ant.
(1)
(2)
Dorsal view
Ventral

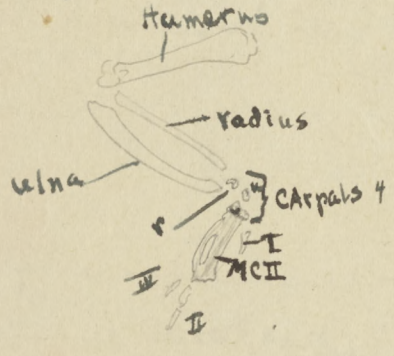

ligamentum acrocoraco-claviculare externum
acrocoracoid
ligamentum capsulare
tuberculum laterale
tendo m. supra-coracoidei
crista lateralis
ligamentum scapulo-claviculare dorsale
ligamentum acrocoraco-humerale
membrana coraco-clavicularis
lig. cristo-claviculare
spina sterni externa
crista sterni
scapula
crista lateralis
tuberculum mediale coracoidi
sterno-coracoidal impression of the sternum


ligamentum accessorium sterno-coracoideum internum
apex cristae sterni
spina sterni externa
labrum ext. des sulcus coracoideus internus (sterni)
systema interarticulare des Sternum
tuberculum labii interni des sulcus coracoideus sterni
=4
foramen pneumaticum


apex cristae sterni 2.
labrum externum des sulcus coracoideus sternum
(interruption of the above)
1) Crista sterni
costae
ligamenta costo-sternalia
tuberculum labii externi des sulcus coracoideus sternum 8
facies interna des crista
processus sterno-coracoideus 9
Supraclavicularis impressio sterno coracoidea 10
incisurae intercostales 13
processus costalis sterni 12
linea intermuscularis (m. supracoracoidei) 18
sternal fenestra notch 16 closed open
pectoralis posterior des Sternum 15
xiphoid process (tuberculum laterale sterni) 17
planum postpectorale 14
margo posterior sterni
angulus post. lateralis
spina sterni ext. (3)
sulcus coracoideus des sternum 5
linea intermuscularis 18
front
costal border



Breast & pectoral girdle of a penguin



clavicles are broken, bird can more fly. Forms part of tuberosum against which the wings work.

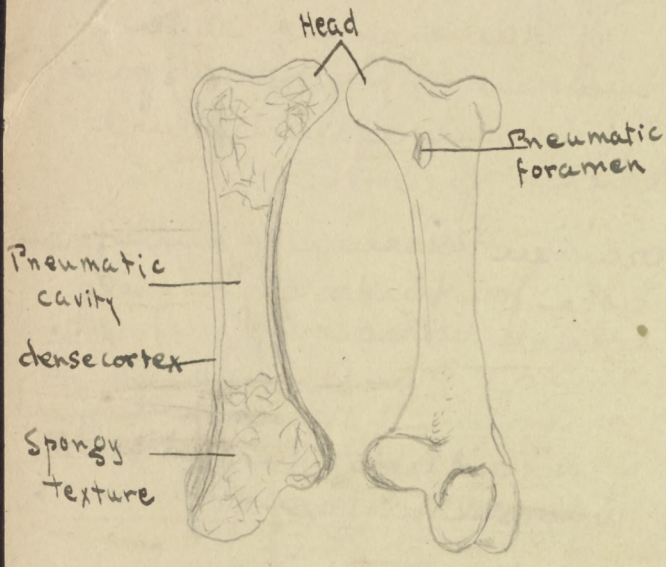
6. Foramen triosseum = pulley hole for tendon of muscle which raises wing (pectoralis minor). Muscle inserts ventrally on sternum, passes up along groove of coracoid to foramen & attaches to dorsal surface of humerus.

7. Reduced mobility in parts of fore-limb
In embryo 4 or 5 carpals
2 form radiale & ulnare
3 fuse to 3 fused metacarpals

8. Pygostyle – fusion of tail vert. for insertion of tail feathers (rectrices)

I Pneumaticity of bird bones.

Thomson



Spongy texture particularly marked in running birds.

Femur of ostrich
(Thomson)

II Tendency to fusion

Skull
Thoracic region } flying birds.
Sacral & adjacent regions
End of tail
Wrist and hand – Carpometacarpus } distinctive of birds
Ankle – Tarsometatarsus }

Scapula + coracoid – Running birds

III Adaptations to flight:-

1. Thoracic vertebrae fused – firm fulcrum for wing action
2. Sternum has keel or carina – insertion of pectoral muscles
   Correlation of strength of keel in proportion to size of sternum with power of flight.
3. Xiphoid process – lightening of bone – splitting up of sternum
4. Backward elongation of sternum – supports viscera
5. Firm attachment of pectoral girdle
   Coracoid fits into deep groove in the sternum
   Upper end bound to front end of scap. by ligaments
   Scapula (oar-like) lashed by ligaments to dorsal surface of ribs along which it lies.

STERNUM

keel (Howe) crista sterni (Pycraft)

1. Carina
2. Carinal apex
3. Ventral manubrial spine
4. Dorsal border (may be tuberosity) } Manubrial ~~area~~ manubrium ? rostrum (Howe)
5. Coracoidal sulcus — Fürbringer
6. Dorsal lip of coracoidal sulcus — Fürbringer
7. Ventral lip of coracoidal sulcus
8. ~~Tubercle of ventral lip of coracoidal sulcus~~ abcial prominence
9. Sterno-coracoidal process — Fürbringer proc. lat. ant. (Pycraft)
10. Sterno-coracoidal ~~fossa~~ ? impression
11. Costal border
12. Costal processes
13. Intercostal spaces
14. Xiphial area — metasternum (Pycraft)
15. ~~Ridge of pectoralis posterius~~ postpectoral lines
16. Sternal fenestra or notch
17. Xiphoid process — PX, (Howe) proc. lat. post. (Pycraft)
18. Intermuscular lines (lateral and inferior)
19. Pneumatic foramina

Hyposternal angle — processus sterno-coracoideus s. praecostalis
" surface — Impressio sterno coracoidea
Episternal process — Spina sterni externum
Costal border — incisurae costales
" — processus "
Fossa coracoidea — sulcus coracoidalis
hyposternae angle — angulus postero-lateralis

FURCULA

clavicle (Howe)
hypocleidium (Howe)

1. Furcular process
2. Coracoidal facet
3. Scapular tuberosity
4. Symphysial area
5. Left and right clavicle

SCAPULA

1. ~~Scapular lip of glenoid fossa~~ glenoid facet
2. Acromion
3. Coracoidal articulation
4. Blade

~~5. Tendinal furrow~~

4 pneumatic foramina

CORACOID

✓ 1. Head — acrocoracoid (wet) (Pycraft 1898)

✓ 2. ~~Supra~~coracoidal canal

✓ 3. Coracoidal lip of glenoid fossa — OR glenoid facet (wet) / cavity (Shufeldt)

~~4. Glenoid fossa~~

✓ 5. Scapular facet — OR (wet) subclav. proc. of precoracoid (wet) / procoracoid (Rowe) (wet) scapular process (Shufeldt)

✓ 6. ~~Pre~~coracoidal ~~process~~

~~7. Dorsal face~~ } omit on list

~~8. Ventral face~~ }

✓ ~~9.~~ ~~Pre~~coracoidal fenestra — opening for supracoracoidal nerve (wet) / ant. clav. for. (Wy) / foramen coracoideum (Rowe) / perforating foramen (Shufeldt)

✓ 10 Sterno-coracoidal process — hyosternal apophysis (wet)

✓ 11 ~~Median~~ Internal distal angle

✓ 12 Sternal facet — OR (wet) ant. facet for (Shufeldt)

✓ Sterno-coracoidal fossa impression

~~13 Sterno-coracoidal fossa~~

omit 14 ~~Sterno-coracoidal process~~

✓ ~~15 Sterno-coracoidal tubercle~~

✓ 16 Clavicular facet — OR (wet)

✓ 17 Neck

✓ 18 Coraco-humeral surface

✓ 19 Brachial tuberosity — OR (wet)

(?) ~~20 Ventral border of clavicular facet.~~

✓ 21. Pneumatic foramina

✓ 22. Bicipital scar

✓ 23 Scar of coraco-brachialis

Coracoid

Head = acrocoracoid (Carinates) s. Spina coracoidea (Ratites)
Hypsternal process = Processus lateralis
Intermuscular line – Linea intermuscularis externa
Sternal facet – Crista ~~intermuscularis~~ articularis sternalis
Sub-Archaeric trough – foramen supracoracoideum
Canal servant de poulie de renvoi au moyen pectoral } canalis supracoracoideus.
Supra clavicular process – Precoracoid or precoracoidal process
Glenoidal facet – labrum coracoideum
Scapular facet – labrum scapulare
Clavicular facet — ? —

Scapula

Principal or furcular process – Acromion

1. Head (ant. in position) coracoid
2. Supracoracoidal canal
3. Coracoidal lip of glenoid fossa
4. Glenoid fossa
5. Scapular facet
6. Precoracoidal process
7. Internal face } dorsal } int. & ext for lateral use
8. ~~External~~ face } ventral
9. Pre Coracoidal cavity
10. ~~Hypsternal~~ process — sterno-coracoidal process
11. Medial distal angle
12. Sternal facet (post. in position)
13. Sterno-coracoid ~~depression~~ fossa?
14. ~~...~~ crest?
15. Hypsternal tubercle — sterno coracoidal tubercle
16. Clavicular facet
17. Neck
18. Coraco-humeral surface
19. Brachial tuberosity
20. Ant. border of clavicular facet

Humerus — Edward — Tuberosities

Head - caput articulare humeri

Ligamentous furrow - sulcus transversus des Tub. mediale humeri.

External trochanter — ? — Tuberculum laterale des Humerus

Bicipital surface - Intumescentia processus medialis humeri
? + Crista medialis des Humerus

Bicipital "coulisse" — Planum intertubercularе s. bicipitale humeri

Pectoral crest - Crista lateralis des Humerus

Articular "coulisse" — Incisura collaris des Humerus

Internal trochanter - Tuberculum mediale des Humerus

Internal crest - Crista medialis des Humerus

Internal trochanteric crest — Tub. med. des Humerus, laterale Schenkel
? (th. med. m?). " " " mediale "

Sub-trochanteric fossa - Fossa jugularis - anconea

Impint of art-brachial muscl — Impressio m. brachialis inferior

Supra-epicondylar tubercle — Processus supracondyloideus lateralis

Epicondyle — Lateral epicondyle (Epicondylus lateralis)

Epitrochlea — Epicondylus medialis

Supra-epitrochlean eminence — Tuberculum supracondyloideum medialis

Cubital condyle — Trochlea ulnaris

Intercondylar "gorge" — Vallis intertrochlearis

Radial condyle — Trochlea radialis

"Gouttières" of triceps muscle - Sulcus anconaeus lateralis and medialis

neck furrow

anconeus (lateralis?) (wet.) agrees with Shufeldt
(medialis?) X ext. met. cad. long (Giv Shufeldt (wet.))

HUMERUS

shaft

1. Head — — — — — OR-Lowe caput (wet). catatrochlearis (Fürbringer)
2. Neck furrow incisura capitis (wet) " cochlearis (Fürbringer)
2. ~~xxxxxxxxxxxxxxx~~
3. ~~Lesser~~ external tuberosity tuberculum (wet) tuberculum mediale / " " " laterale } Fürbringer 1897
4. ~~Greater~~ internal tuberosity
5. medial crest ridge of tuberculum crista tuberculi mediales Fürbringer — tub. med.
6. Pneumatic fossa subtrochanteric (Lowe); (wet) fossa pneumbalconaea (OR wet) Latinized OR (Fürbringer)
7. Pneumatic foramen
8. ~~Neck~~ Olecranon fossa Bicranal fossa
9. Bicipital crest crista superior (wet) crista medialis (Fürbringer)
10. Bicipital furrow
bicipital surface groove intumescentia proc. medialis (Fürbringer)
11. External tricipital ~~furrow~~ groove sulcus adconaeus lateralis / medialis } Fürbringer
12. Internal tricipital ~~furrow~~ groove
13. Ligamental furrow ~~or pit~~ sulcus transversus des Tub. med. (Für)
14. Ulnar condyle — — — — — — OR — trochlea (Für) alsocondyle (wet)
15. Radial condyle — — — — — — OR → ~~trochlea~~ Für (wet) (ulnar crest (Owen) / radial crest (Wetmore))
16. Ectepicondyle epicondylus lateralis (Fürbringer) / " medialis "
17. Ent epicondyle
18. Ectepicondylar ~~tuberosity~~ prominence OR → process (wet) proc. supracondyloideus lat. (Für)
19. Entepicondylar ~~tuberosity~~ prominence " " (wet) tub. " → " med. (")
20. Intercondylar furrow intertrochlear sulcus (wet) vallis intertrochlearis (Für)
21. Imprint of bracnialis ~~anteriopia~~ anconeus dep. for brach. inferior (Fürbringer) Knott (Für)
22. Pronator scars } flexor scars
Scar of pronator brevis Hach. of (wet)
23. Supinator scar (on edge of extensor pits)
24. Extensor pit
25. Attachment of deltoides ventralis (may be line or tubercle) Attachment of coraco brachialis
26. ~~Papilla~~ scar of ~~scapulo-humeralis anterioris~~ supra spinatus
26b Scar of ~~the~~ infra spinatus
27. ~~Papilla~~ for latissimus dorsi posterioris ~~tuberosity~~ lat. dorsi OR linea instead of scar (wet) (Für)
28. Line or latissimus dorsi anterioris
29. Surface for anconeus articular ligament OR (Für)
~~30. Imprint of brachialis anticus~~
30. Brachialis impression
31. Pectoral scar
popliteal depression (wet) fovea supratrochlearis ventralis (Fürbringer)

Synonymy for Humerus (From Furbringer)

Caput humeri — BNA

Caput articulare -- Furbringer

Tete articulaire, Gelenkopf, articular head, caput articulaire -- Vicq D'Azy, Tiedmann, Meursinge, Coues, Selenka, Gervais et Alix

Tete, Head -- Cuvier, Owen, Milne-Edwards, Sabatier

Proximal articular surface -- Owen

Saillie articulaire qui correspond a la tete -- Alix

Articular surface of the proximal end -- Watson

Incisura collaris -- Furbringer

Tiefe Rinne -- Tiedmann

Coulisse articulaire -- Milne-Edwards articular groove

Rainure profonde -- Alix

Fosse profonde -- Sabatier

Supra-capitular ridge -- Forbes

Horizontal Groove -- Watson

Processus lateralis humeri -- Furbringer

Grosse tuberosite, Greater tuberosity, Great tuberosity -- Vicq d'Azyur, Rolleston, Perrin, Shufeldt

Grosse tuberosite (trochiter), Crete externe -- Cuvier

Vorderer Knorren -- Nitzsch

Vordere Leiste -- Meckel, Stannius

Obere Leiste, Upper crest, Superior crest -- Schopss, Owen, Coues

Tuberculum externum s. inferius -- Thuet

Radial crest (greater tuberosity and pectoral and deltoidal ridge) -- Owen, Marsh

Crista -- Jager

Tuberosite externe (Trochiter) -- Alix, Sabatier

Tuberosite anterieure -- Gervais et Alix

Tuberosite radiale -- Oustalet

Oblique ridge -- Watson

Trochanter externus -- Dames

Tuberculum laterale (Tuberculum m. supracoracoidei) -- Furbringer

Oberer Hacker, Tuberculum superius -- Wiedemann, Tiedemann, Schopss, Gurlt, Meursinge, Klemm, Magnus, Selenka

Oberes Ende der Leiste -- Meckel

Ausserer Hacker, Tuberculum externum, Tubercle externe -- Meckel, Thuet, Pfeiffer, Gervais et Alix

Tuberculum minus -- Mayer

Condyle superieur -- Jacquemin

Tuberculum cristae humeri -- Jager de Man

Hacker -- Klemm

Outer tuberosity -- Owen

Great tuberculum, Tuberculum majus -- Macalister, Haughton, Magnus, deMan

Radial tuberosity, tuberosite radial -- Owen, Oustalet

Great tuberosity -- Ralleston, Owen

Top of the pectoral ridge -- Haughton

Trochanter externe -- Milne- Edwards external trochanter (medial?)

Articular facet on the great summit of the great tuberosity -- Perrin

Tubercle rugueux, Saillie tuberculeur -- Alix

Tubercle superieur de la crete pectorale -- Alix, Sabatier

Ecto-tuberosity -- Owen (1877)

Tuberosite anterieure -- Gervais et Alix

Tubercle for the insertion of the pectoralis II, -- Forbes

Deep depression for the tendon of the pectoralis medius -- Watson

Lesser tuberosity -- Weldon

Tuberculum minus BNA

Synonymy for Humerus continued

Crista lateralis, Crista pectoralis -- Furbringer
Apophyse qui se jette en dehors -- Vicq d'Azyr
Grosse Hervorragung -- Wiedmann
Crete superieure, Crista superior, Obere Leiste, Obere Spina -- Cuvier Alix,
Crista tuberculi superioris, Leiste des oberen Hackers, Vom oberen Hocker entspringende Leiste -- Tiedemann, Schopss, Nitzsch, Giebel Meursinge, Jager, Klemm, Selenka
Leiste, Crista, Humeral crest, Ridge -- Meckel, Nitzsch, Geibel, Meursinge, Jager, Klemm, Young, Forbes
Spina tuberculi minoris -- Mayer
Ligne saillante sur le bord superieur -- Jacquemin
Spina tuberculi externi -- Pfeiffer
Deltoid ridge, Deltoid crest, Crete deltoidienne -- Haughton, Huxley, Gervais et Alix, Sabatier, Weldon
Pectoral ridge, Crete pectorale, Saillie en crete destinee a l'insertin due muscle grand pectoral -- Haughton, Owen, Eyton, Milne-Edwards, Alix, Garrod, Oustalet, Sabatier, Forbes
Ridge for the pectoralis and deltoideus, Delto-pectoral ridge, Crete pectaro-deltoidienne, Owen, Perrin, Gervais et Alix, Sabatier
Spina tuberculi superioris -- Magnus
Anterior crest for the pectoralis -- Parker
Crista lateralis -- Rudinger
Crista tuberculi majoris -- de Mann
Crete pectorale -- Alix
Pectoral lamina, Ridge for the insertion of the great pectoral muscle -- Garrod
Crete trochiterienne -- Sabatier
Radial crest -- Shufeldt
Oblique ridge, Linear groove for the insertion of the pectoralis major -- Watson

Processus medialis -- Furbringer
Face interne de la tete humerale -- Vicq d'Azyr
Crete interen, innere Leiste -- Cuvier, Stannius
Crete inferieure, Lower Crest -- Cuvier, Owen
Unner und obere Lesite -- Schopss
Hintere Leiste -- Stannius
Ulnar crest (Lesser tuberosity and ridge for the latissimus) -- Owen, Marsn, Shufeldt
Inferior Crest -- Coues
Tuberosite posterieure -- Gervais et Alix
Lesser tuberosity -- Shufeldt

Die Fossa pneumo-anconaea (pneumo-tricipitalis) -- Furbringer
Fosse profonde -- Cuvier
Grube -- Tiedemann
Apertura acustica -- D'Alton
Troupneumatique, Luftloch, Foramen pneumaticum, Pneumatic foramen -- Jacquemin, Klemm, Owen, Selenka, Weldon, etc.
Pneumatic fossa, Fossette aerienne -- Gervais et Alix
Fosse sous-trochanterienne -- Milne-Edwards
Left sinus -- Rudinger
Z. Th, Large depression situated below the inner tuberosity -- Perrin
Depression sous-trochanterienne -- Oustalet
Subcitcular fossa -- Shufeldt
Infracapitular fossa -- Forbes
Deep circular excavation -- Watson

* pneumatic foramen within the fossa

Synonymy for Humerus continued (page 3)

Tuberculum mediate -- Furbringer
Apophyse qui se recourbe verse le thorax -- Vicq d'Azyr
Petite tuberosite (Trochin) -- Cuvier
Unterer Hocker, Tuberculum inferius -- Wiedemann, Tiedemann, Schopss, Hensinger, Meursinge, Magnus, Selenka, Klemm, Ulrich
Tuber minor -- van Hasselt und Kuhl
Innerer Hocker, Tuberculum internum -- Meckel, Mayer
Condylus internus -- Mayer
Apophyse sur le bord inferieure -- Jacquemin
Obere Hocker -- Gurlt
Tuberculum majus -- Pfeiffer
Tuberculum minus, Kleines Tuberculum -- Haugnton, Rudinger
Lesser tuberosity -- Owen
Inner tuberosity -- Owen, Macalister, Perrin
Ulnar tuberosity -- Owen, Macalister, Perrin
Anterior tuberosity -- Owen
Vorderer Hocker -- Klemm, Gadow
Trochanter interne, Milne-Edwards, Alix, Oustalet
Medialer Hocker, Tuberculum mediale -- Rudinger
Tuberosite interne -- Alix, Sabatier
Trochin -- Alix, Sabatier
Petit trochanter, Lesser trochanter -- Alix, Forbes
Entotuberosity -- Owen,
Tuberosite posterieure -- Gervais et Alix
Great tuberosity -- Weldon
Tuberculum majus BNA

Fossa anconaea -- Furbringer
Foramen coecum -- Reid
Deep depression -- Owen
Trous borgen, Grand excavation cupuliforme repondant a la fossette de aerienne -- Gervais et Alix
Tricipital rossa -- Watson

ULNA

1. Olecranon ~~process~~ — olecranon (wet)
2. Distal radial depression — inferior — — (wet)
3. Trochlea — carpal articulation (wet)
4. External ~~carpal~~ condyle
5. Internal ~~carpal~~ condyle
6. ~~Epicondyle~~ carpal tuberosity — (carpal tuberosity)
7. Bicipital ~~attachment~~ scar
8. ~~Surface for~~ brachialis anticus ~~(or depression of)~~
9. ~~Eminence~~ or anterior articular ligament
10. Proximal radial depression
11. External cotyla — (glenoid surfaces (wet))
12. Internal cotyla
13. Quill ~~knobs~~ papillae — (papillae for attach. of secondaries (wet))
    - Anconal row (always present)
    - ~~Ulnar~~ internal row
14. Intermuscular lines
15. ~~Pit of triceps brachii, caput longum~~ (tricipital ~~pit~~) attachment
16. Tendinal ~~pit or furrow~~ pit
17. Ligamental ~~attachment~~ scar of ~~condyle~~ carpal tuberosity
18. Intercotylar area
19. Bicipital scar — (insertion of dist. post. of triceps (wet))
20. Extensor papilla
21. Humero-ulnar depression
22. Tendinal furrow groove

nutrient foramen (wet.)

OK

RADIUS

1. Bicipital ~~tuberosity~~ tubercle
2. Tendinal ~~furrow~~ groove
3. Scapholunar facet
4. ~~Proximal~~ ulnar facet (~~ulnar side of capitular tuberosity~~)
5. ~~Distal~~ ulnar depression
6. Ligamental (pro)eminence
7. Humeral cotyla
8. Capital tuberosity (~~on medial side~~)
9. Head
10. Ligamental papilla (~~on medial side~~)
11. Intermuscular lines

~~12 Supinator scar~~

head ~~metacarpus~~?

OK

CARPO-METACARPUS

~~Radial metacarpal~~

1. ~~Radial protuberance~~ process of MI

2. Pollical facet — articular facet for pollex (wet)

3. ~~Anterior carpal fossa~~ — OK (wet)

4. ~~Ligamental surface~~

5. Pisiform process — OK (wet.) proc. muscularis metacarpi II (Lambrecht)

metacarpal I — OK (wet.)

6. Metacarpal II

7. Metacarpal III

8. ~~Internal tendinal groove~~

9. ~~External tendinal groove~~ — OK (wet) Sul. tendinis M. ext. dig. comm. (Lambrecht 1912)

10 Carpal trochlea — head (wet.)?

~~11 Posterior carpal fossa~~

12 Facet for digit II (internal)

13 Facet for digit III (external)

14 Intermetacarpal ~~imprint or tuberosity~~ tuberositas musculi ext. metacarpi III (Lambrecht) — tuberculum radiale (Lambrecht)

15 Intermetacarpal ~~space~~ — fissura metacarpi (Lambrecht)

16 ~~Internal~~ ligamental fossa — OK (wet more)

17 Distal metacarpal symphysis — fornix metacarpi (Lambrecht)

~~18 Pneumatic foramen~~

? 19. ~~Proximal~~ metacarpal symphysis

? 20. ~~Distal metacarpal radial tuberosity~~ (internal)

ligamental scar of pisiform process

~~Carpal~~ external lig. "

Extensor scar

~~Distal metacarpal process~~ tubercle of MII

tuberculum radiale (Lambrecht)

Flexor scar

prox. insertion of 2nd metacarpal (wet)

radial = palmar (wet) (Lambrecht)

ext. tibiae = ambiens-pubic (Marcucci)

m. adductor femoris (Marcucci = pub. ischiofemoralis in bird '23)

PELVIS

✓ 1. Ilium
2.
✓ 2. Ischium
✓ 3. Pubis
✓ 4. Acetabulum — — — — OR (Howell) (Schöler)
✓ 5. Obturator foramen ——— OR Howell (") (Marcucci)
✓ Ischio-pubic fenestra ——— foramen oblongum (Schöler)
✓ 6. Antitrochanter OR (Schöler)
✓ 7. Anterior iliac crest linea ilio dorsalis } Lebedinsky 1913
✓ 8. Posterior iliac crest " " lateralis }
✓ 9. Median dorsal ~~area (or crest)~~ ridge
10 Ilio-ischiatic ~~foramen~~ fenestra (foramen ischiadicum - (Schöler 1925) (Marcucci)
11 Sacral roof
✓ 12 ~~Anterior~~ } renal depression — ant } fossa iliaca
13 ~~Posterior~~ } post }
✓ 14 Synsacrum
✓ 15 Median ventral ridge
✓ 16 Subiliac spaces
✓ 17 Ischial angle

neural spine
prezygapophysis
synsacral thoracic vertebrae
" caudal "
——— lumbar "
sacral "

parapophysis
costal facets
pectineal process
interdiapophysial foramina — OR (Schöler) (Lebedinsky) (Marcucci)
(for. intertransversaria ext. & int. Lebedinsky)

Femur

BNA →

1 Head – Caput femoris

2 Fovea capitis femoris — Round ligament

3 Neck — Collum femoris

4 Greater trochanter — Trochanter (major)

5 Superior articular surface —

6 Medial condyle (internal) — Condylus medialis

7 Lateral condyle (external) — " lateralis

8 Patellar groove — Facies patellaris

9 Intercondylar fossa — Fossa intercondylaris

10 Popliteal fossa area — Planum popliteum

11 Peroneal groove —

12 Peroneal tibial crest —

13 Pneumatic orifice

14 Gluteal line ?

15 Linea aspera

16 Ant. intermuscular line

17 Pneumatic orifice ?

L

Femur

Iliac facet

Head — caput — Crista des femurkopfes

Neck

scar of round ligament

trochanter — T. major (minor is under head) Sadow

obturator ridge — —— OR (Sadow)

posterior intermuscular line (linea aspera?) (Skeptal)

anterior " — " (for femore-tibialis) Sadow

internal condyle — condylus medialis (Sadow 1894

external condyle — " lateralis

fibular condyle — facet for ant. vast. head of fib (Sadow).

fibular furrow

intercondylar furrow — sulcus intercondyloideus Sadow

popliteal area — OR → fossa (Sadow)

patellar ~~furrow~~ groove

flexor scars

fit for tibialis anticus

ligamental scar

?, — for biceps cruris

gastrocnemius abnormis post

ilio-femoralis (3 places and lg)

is-fem. (1 " ")

pubo-ischio-femoralis

Sadow 1896

~~Obturator ridge~~

extensor femoris OR Macalister

adductor longus

" magnus } ad. femoris OR Shufeldt

Pectineo-Macalister

P.i. + vast

TIBIO-TARSUS

1. Fibular crest
2. Furrow for ~~short peroneal muscle~~
3. Internal condyle
4. External condyle
5. Anterior intercondylar ~~fossa~~
6. Posterior intercondylar ~~fossa~~
7. Supratendinal bridge
8. ~~Inner~~ cnemial crest
9. ~~Outer~~ cnemial crest
10. External ~~condylar~~ surface
11. Internal condylar surface
12. Inter~~condylar~~ area
13. Rotular ~~process~~
14. Ligamental attachment ~~pit~~
15. Tendinal ~~furrow~~
16. ~~Orifice~~ for medullary artery
17. Flexor scar
18. Ligamental scar
19. ~~Fibular facet~~
- ~~Supratendinal Bridge~~
- external ligamental ~~attachment~~
- internal ..

Tibia

BNA

2.) ~~Lateral~~ articular surfaces
2. Myositis of insertion of deep flexor muscles of digits
~~Fibular~~ ~~Peroneal~~ crest — Impressio fibularis (?)
~~Groove~~ for short peroneal muscle
~~Medial~~ condyle — (Condylus medialis
~~Lateral~~ .. — .. lateralis) proximal end
Anterior intercondylar ~~area~~ fossa — Fossa intercondyloidea anterior
Posterior .. fossa — .. .. posterior
~~Tendinous~~ groove — (precondylar groove)
Supratendinous bridge —
~~Tuberosity~~ ~~Lateral~~ crest ——— Crista anterior
~~Lateral~~ ~~External~~ crest —
~~Articular~~ Extracondylar surface —
~~Articular~~ Extracondylar .. —
Intercondylar ~~tubercle~~ area —
Ligamental attachment — (proc. for ext. lig.

Patellar process
Semilunar fovea

TARSO-METATARSUS

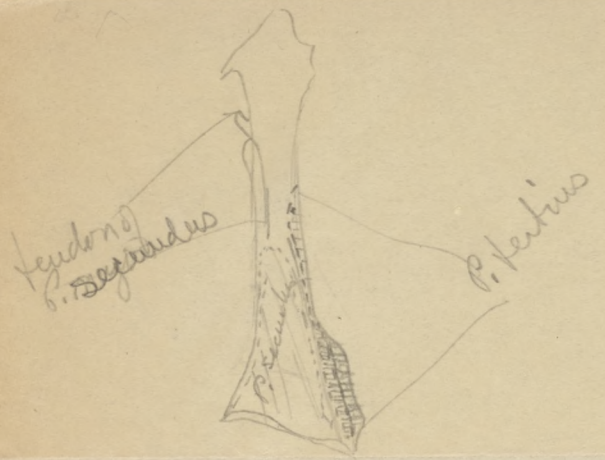
1. External cotyla
2. Internal cotyla
3. Intercotylar ~~tuberosity~~ prominence
4. Intercotylar depression

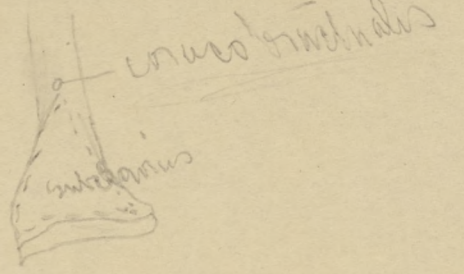
} Intercotylar area

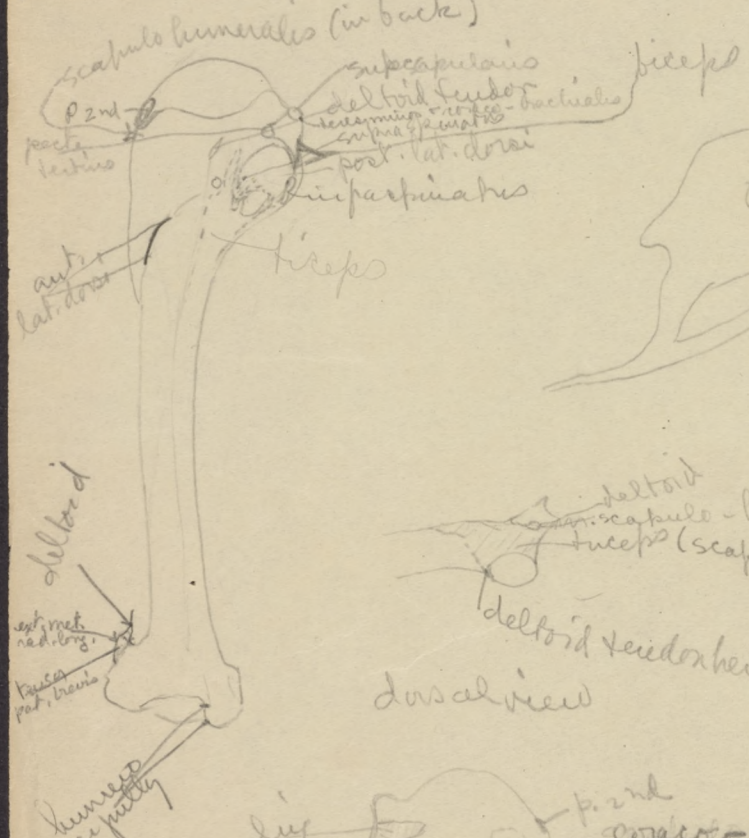
5. Hypotarsus
   - Calcaneal ridges
   - Tendinal canals
6. Internal trochlea
7. External trochlea
8. Median trochlea
9. External intertrochlear notch
10. Internal intertrochlear notch
11. ~~Furrow for extensor hallucis brevis~~
12. Anterior metatarsal furrow
13. ~~Furrow for extensor~~ longus digitorum
14. Distal ~~aperture~~ foramen
15. ~~Posterior~~ metatarsal facet
16. ~~Internal~~ proximal foramen
17. External proximal foramen
18. Scar of ~~the tibialis posticus~~ external ligament
19. ~~Papilla for the~~ tibialis anticus
20. posterior metatarsal ~~furrow~~
21. Ligamental attachments

~~22xExtxxxxxxxxfuxrxw~~

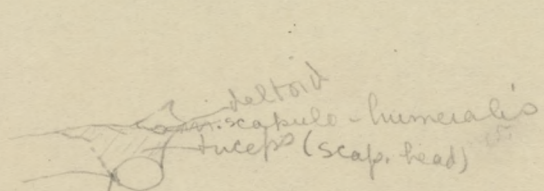
~~Scar of~~ the external ligament

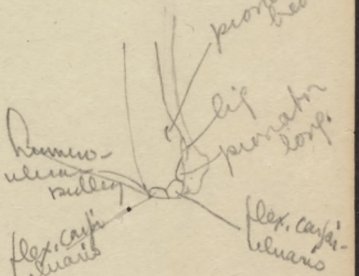

tendon of
P. sternalis
P. costalis
P. clavicularis

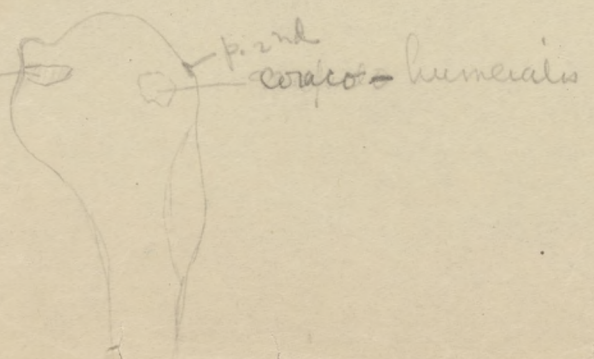

coraco-humeralis
subclavius

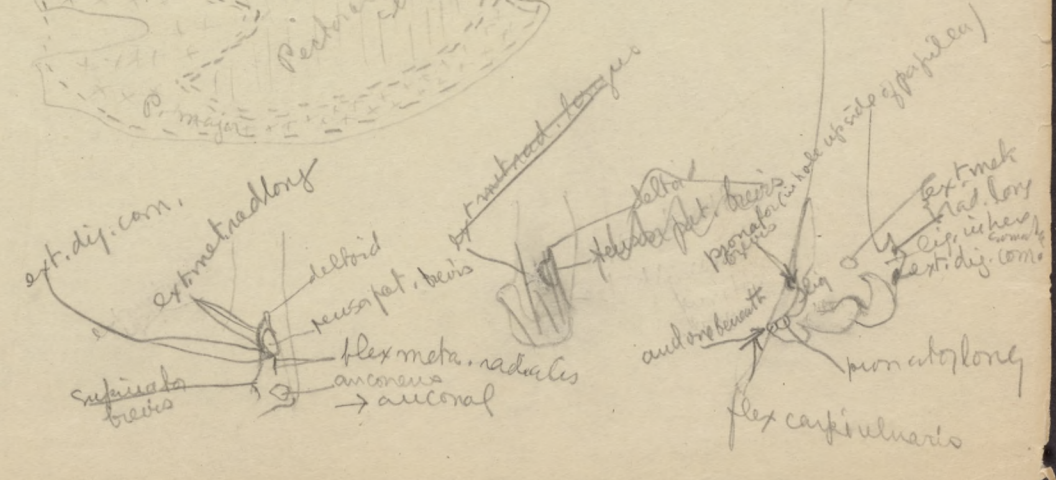

scapulo humeralis (in back)
subscapularis
P. 2nd
deltoid tendon
pecto-
teretes
supra spinatus
post. lat. dorsi
infraspinatus
biceps
ant. lat. dorsi
triceps
deltoid
ext. meta
rad. long.
brachio
rad. brevis
humero
ulnaris
patella

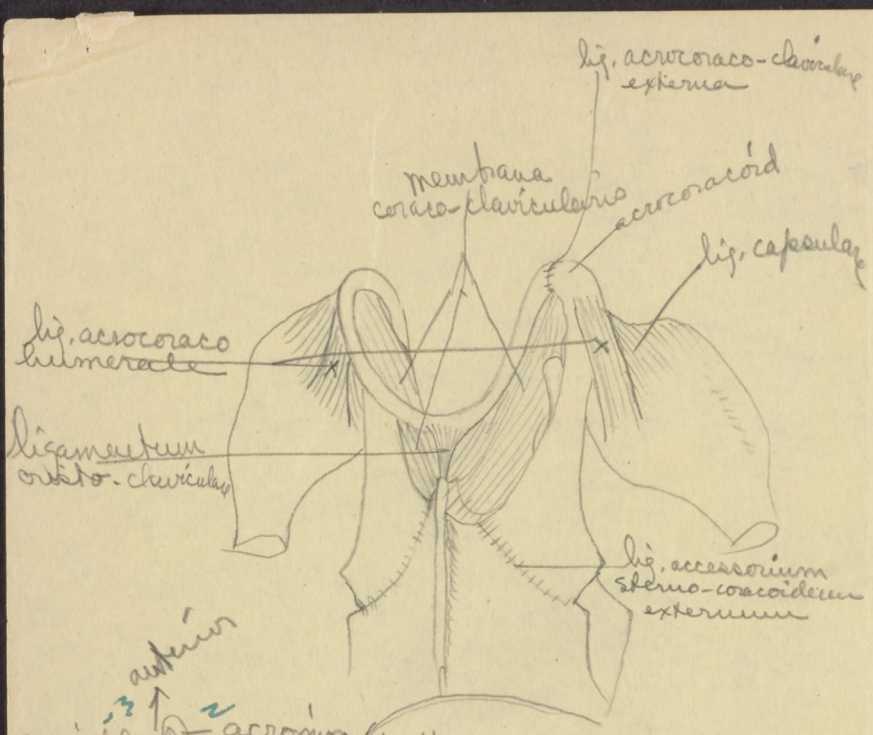
rhomboideus
supraspinatus
infraspinatus
trapezius
ligament
coraco humeralis
teres
major
thoraco-
scapularis
subscapularis
biceps
Pectoralis
subclavius

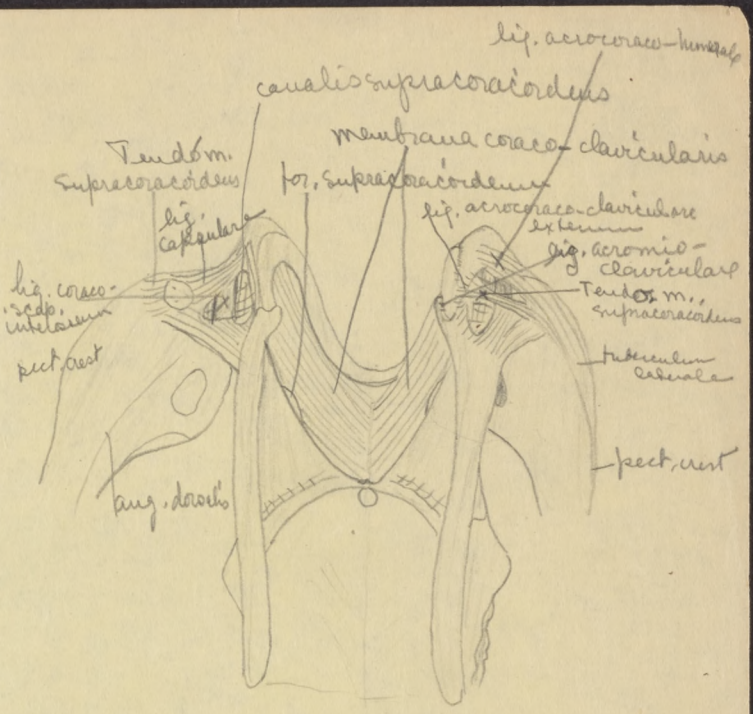

deltoid
scapulo - humeralis
triceps (scap. head)
deltoid tendon here too
dorsal view

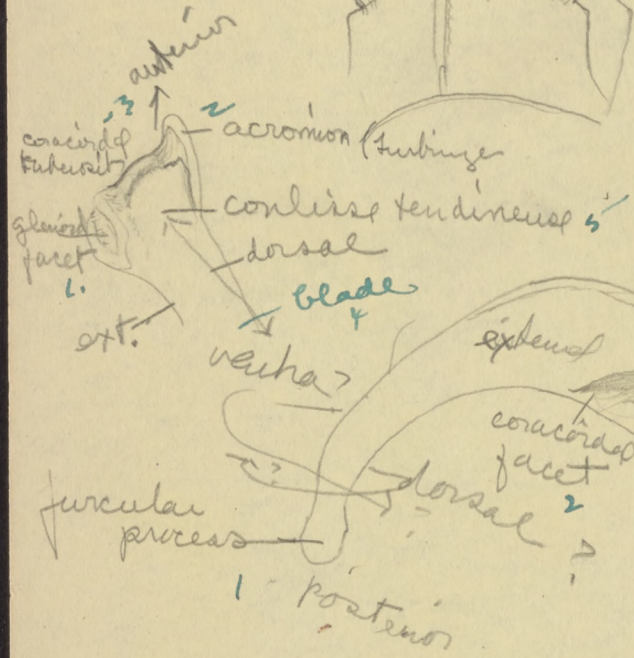

pronator
teres
humero
ulnaris
flex. carpi
ulnaris


lig
P. 2nd
coraco - humeralis

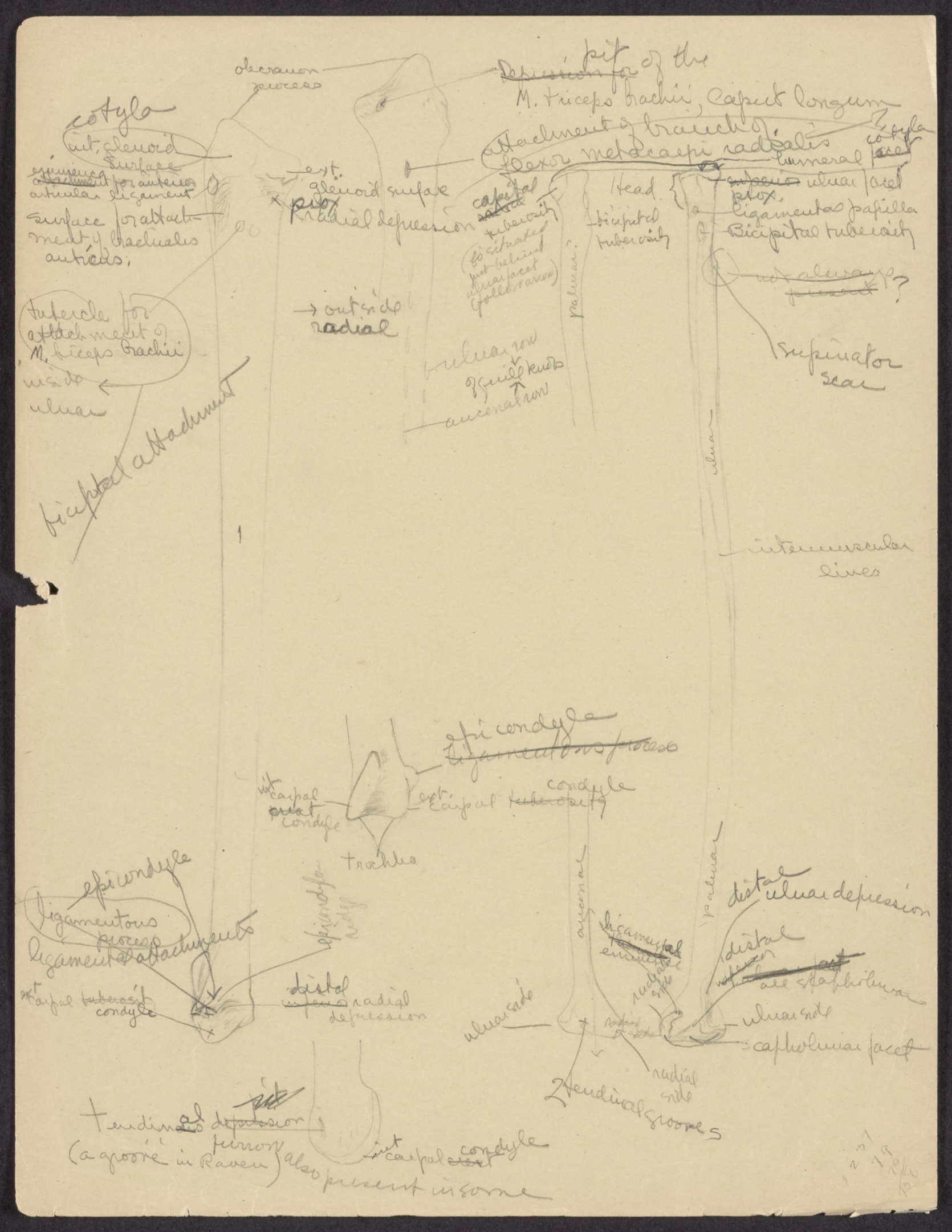

ext. dig. com.
ext. metradlong
deltoid
teres pat. brevis
flex. meta. radialis
anconeus
supinator
brevis
ancon
pronator teres
lig
ext. meta
rad. long
ext. dig. com.
pronatoplong
flex carpi ulnaris







Same serrant de fonction
semble au muscle moyen pectoral,


olecranon process
cotyla
int. glenoid surface
articular ligament
surface for attachment of radialis anticus
ext. glenoid surface
radial depression
pit of the
M. triceps brachii, caput longum
attachment of branch of
flexor metacarpi radialis
cotyla humeral face
capital tuberosity
(is situated just behind ulnar facet of olecranon)
head
bicipital tuberosity
ulnar facet
ligamentous papilla
Bicipital tuberosity
tubercle for attachment of M. biceps brachii
radial side
ulnar
outside radial
ulnar row of quill knots
ancon
palmar
supinator scar
bicipital attachment
1
interosseous lines
ulnar
ulnar
epicondyle
ligamentous process
int. carpal condyle
ext. carpal tuberosity
condyle
trochlea
epicondyle
ligamentous process
ligament attachments
epicondyle
ext. carpal tuberosity
condyle
distal radial depression
palmar
ancon
distal ulnar depression
distal
ligamental eminence
radial side
ulnar side
ulnar side
radial side
capitulunar facet
tendinal pit
tendinal depression
(a groove in Raven) also present in some
int. carpal condyle
tendinal grooves

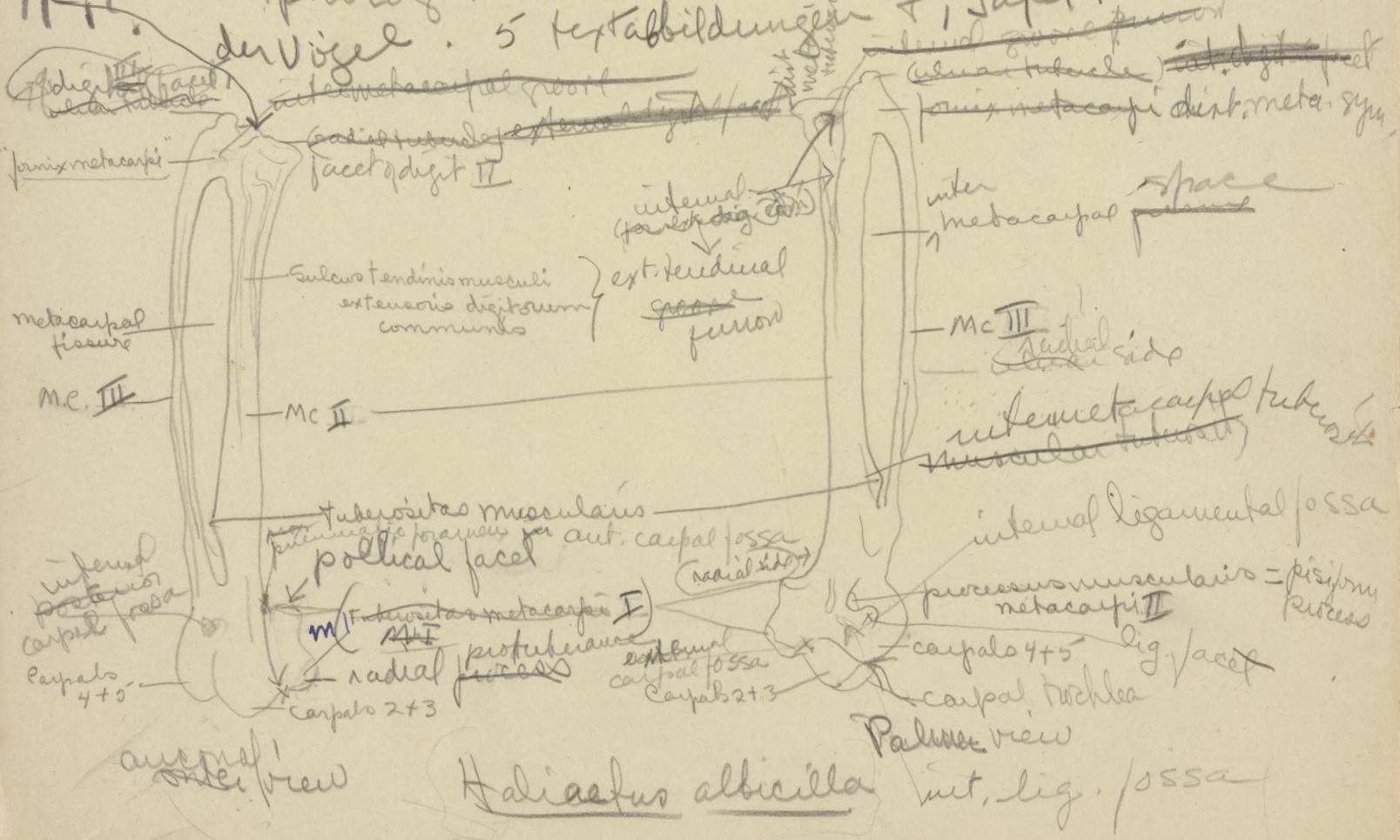
Hungarian Central Office of Ornithology
Budapest, Hungary

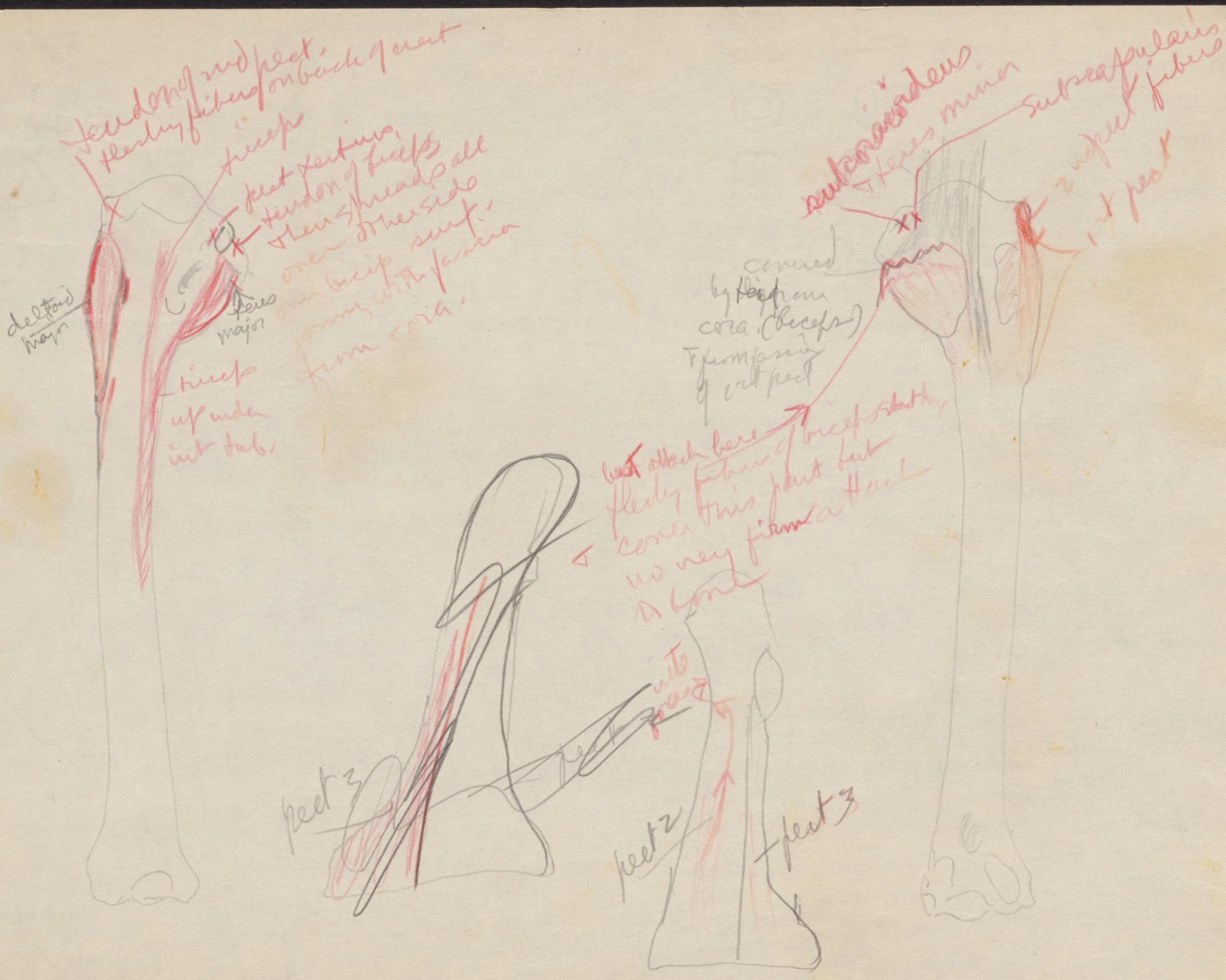
Lambrecht, Dr. K. (Koloman)

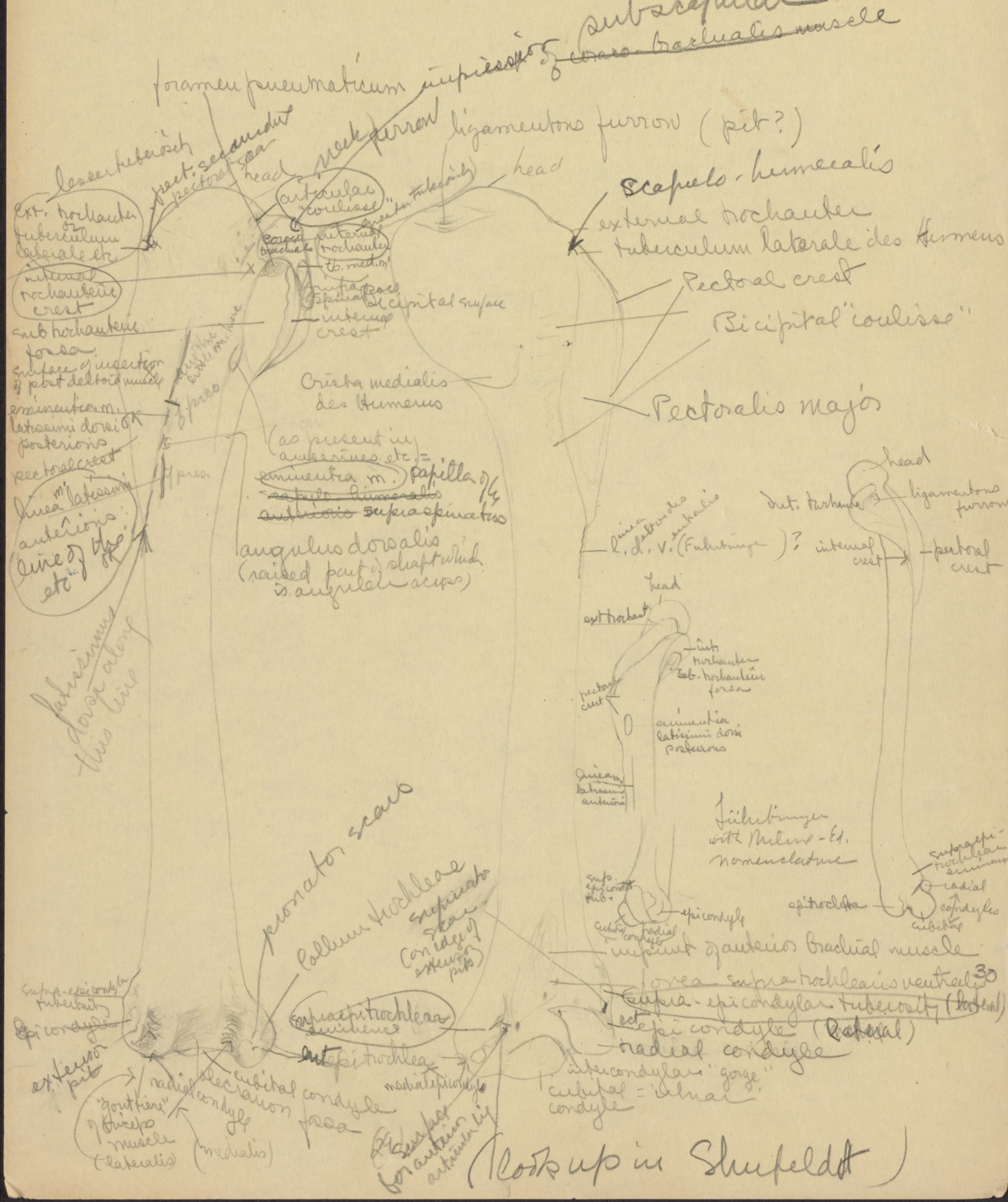
(#'s changed from the way Lambrecht gives them II=I, etc.)

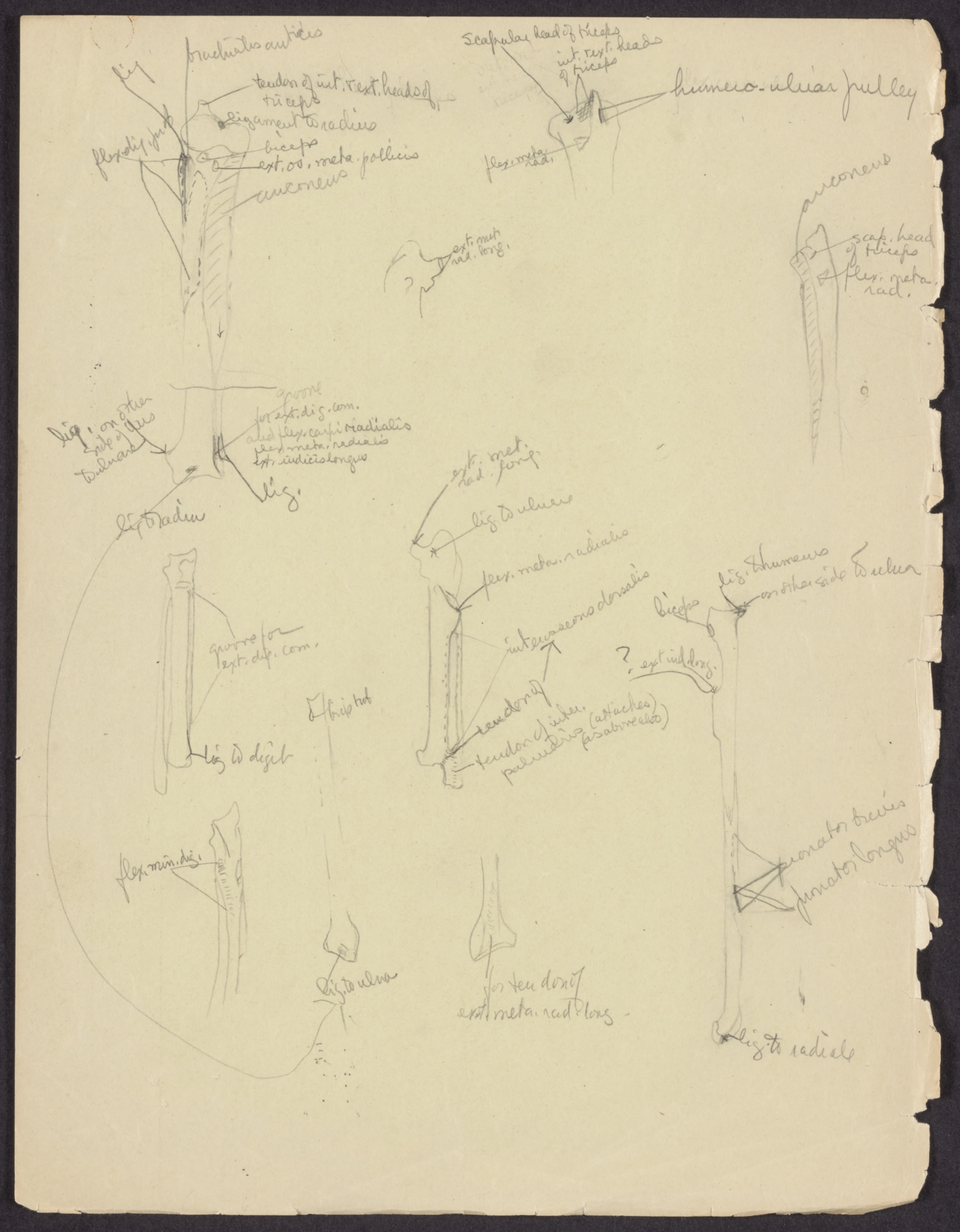
Aquila Vol 21, 1914

Morphologie des Mittelhandskelettes der Vögel. 5 Textabbildungen u. 1 Tafel.




tendon and pect. fleshy fibers on back of bicep
bicep
pect tendon flesh all over shoulder and bicep same with pass from coria.
deltoid major
teres major
bicep up under int tub.
subscapularis
teres minor
subscapularis fibers
pect
covered by pectoralis major
coria. (biceps)
Transparency of pect
bicep attach here fleshy fibers of bicep stretch cover this joint but no very firm attach
A bond
into
pect 3
pect 2
pect 3


subscapular
foramen pneumaticum impressio
ligamentous furrow (pit?)
scapulo-humeralis
external trochanter
tuberculum laterale des Humerus
Pectoral crest
Bicipital "coulisse"
Pectoralis major
Crista medialis des Humerus
(as present in anseriines etc.) = papilla
angulus dorsalis
head
ligamentous furrow
Fürbringer
with Nitsch-El. nomenclature
supinator scars
(collum trochleae)
supra-epicondylar tuberosity (lateral)
epicondyle (lateral)
radial condyle
intercondylar "gorge"
cubital = ulnar condyle
(Look up in Shufeldt)


brachialis anticus
tendon of int. ext. heads of triceps
ligament to radius
biceps
ext. oss. meta. pollicis
anconeus
flexor dig. prof.
groove for ext. dig. com. and flex. carpi radialis
flex. meta. radialis
ext. indicis longus
lig. to radius
lig. on other side of ulna
ext. met. rad. long.
lig. to ulna
flex. meta. radialis
interosseus dorsalis
tendon of
tendon of inter. pollicis (attaches to abductor)
lig. to digit
flex. min. dig.
lig. to ulna
ext. ten. dorsi
ext. meta. rad. long.
Scapular head of triceps
int. ext. heads of triceps
humero-ulnar pulley
flex. meta. rad.
scap. head of triceps
flex. meta. rad.
lig. to humerus
biceps
? ext. ind. long.
pronator brevis
pronator longus
lig. to radius

Important muscles

Brachialis anticus – flexes forearm on humerus
on Manualla greatly reduced on humerus to flat surface + ridge along int. edge (What is papilla for at base of brachial impression at tip of ext condyle? Not present in Man ateles or Pramanualla)
on ulna scarcely discernible; probably occupies area on palmar surface than internally and very short. Possibly same on Pramanualla
In both Manus + Prae, lig. attach (nib) is very large + extends palmad to tip of nib coryla

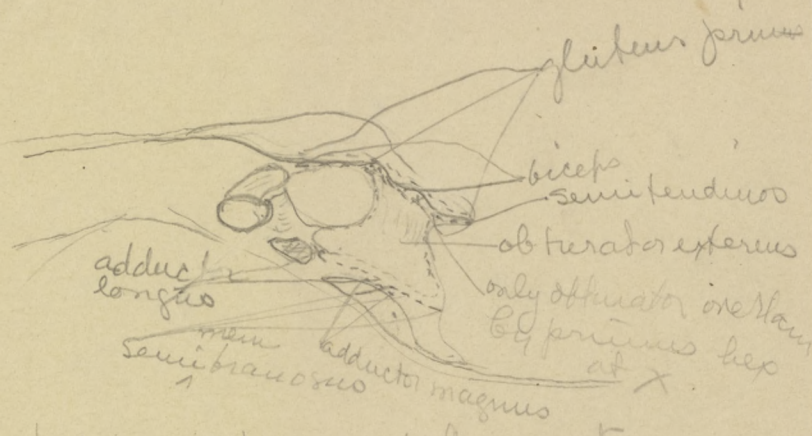
Pectoralis – depresses the wing + possibly moves it forward.

Pect. 2 = supracoracoideus (in pneumatic abt ext tuber. on edge anconally (pmx)
(goes through fibrous canal of coracoid from sternum)
Elevates humerus (by means of pulley action in trio. canal)

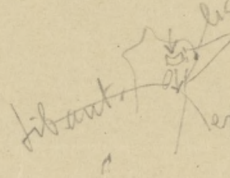
Also elevating humerus (@ Padua in on manualla (pabu) are deltoid + tensor patagii longus (quote from Watson 1883)

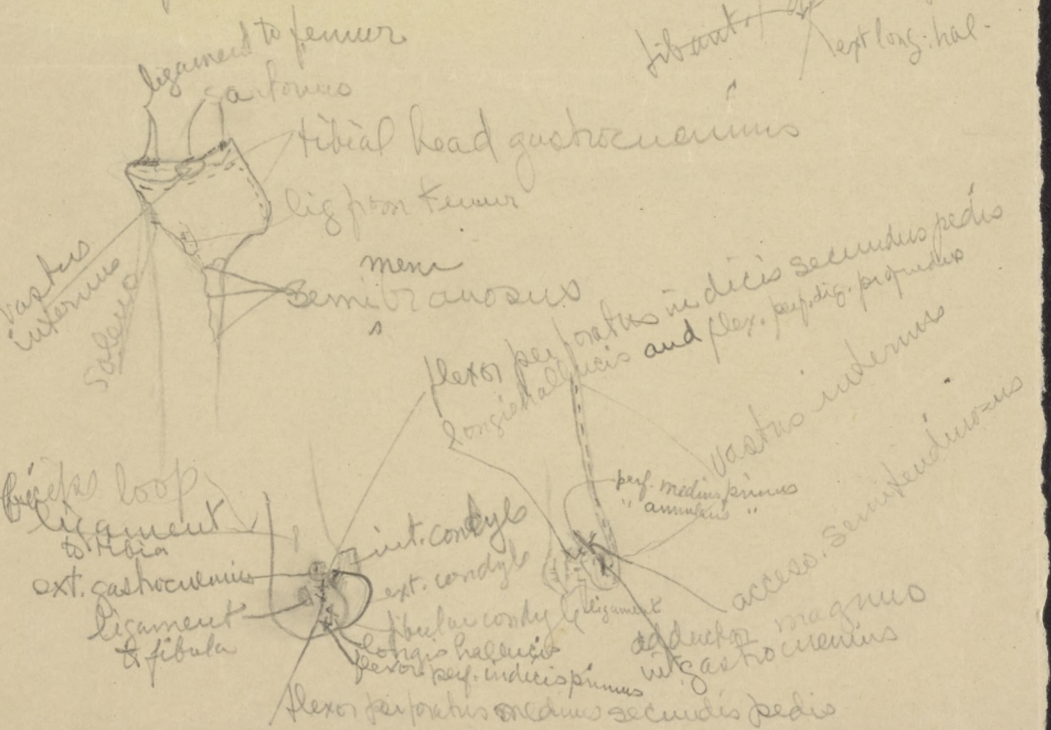
Tensor patagii brevis – attaches on ectepi cond. process with extensor metacarpi radialis – flexes forearm + extends metacarpus

Tensor patagii longus – attaches to proc M1
Extends hand + flexes forearm on humerus



gluteus primus on top of post. iliac crest
biceps on anteior portion of post. iliac crest, ~~just~~ under
side of the crest
semitendinosus - under primus at post. end
of post. iliac crest
obturator externus - occupies ilium below the
post - iliac crest.





9

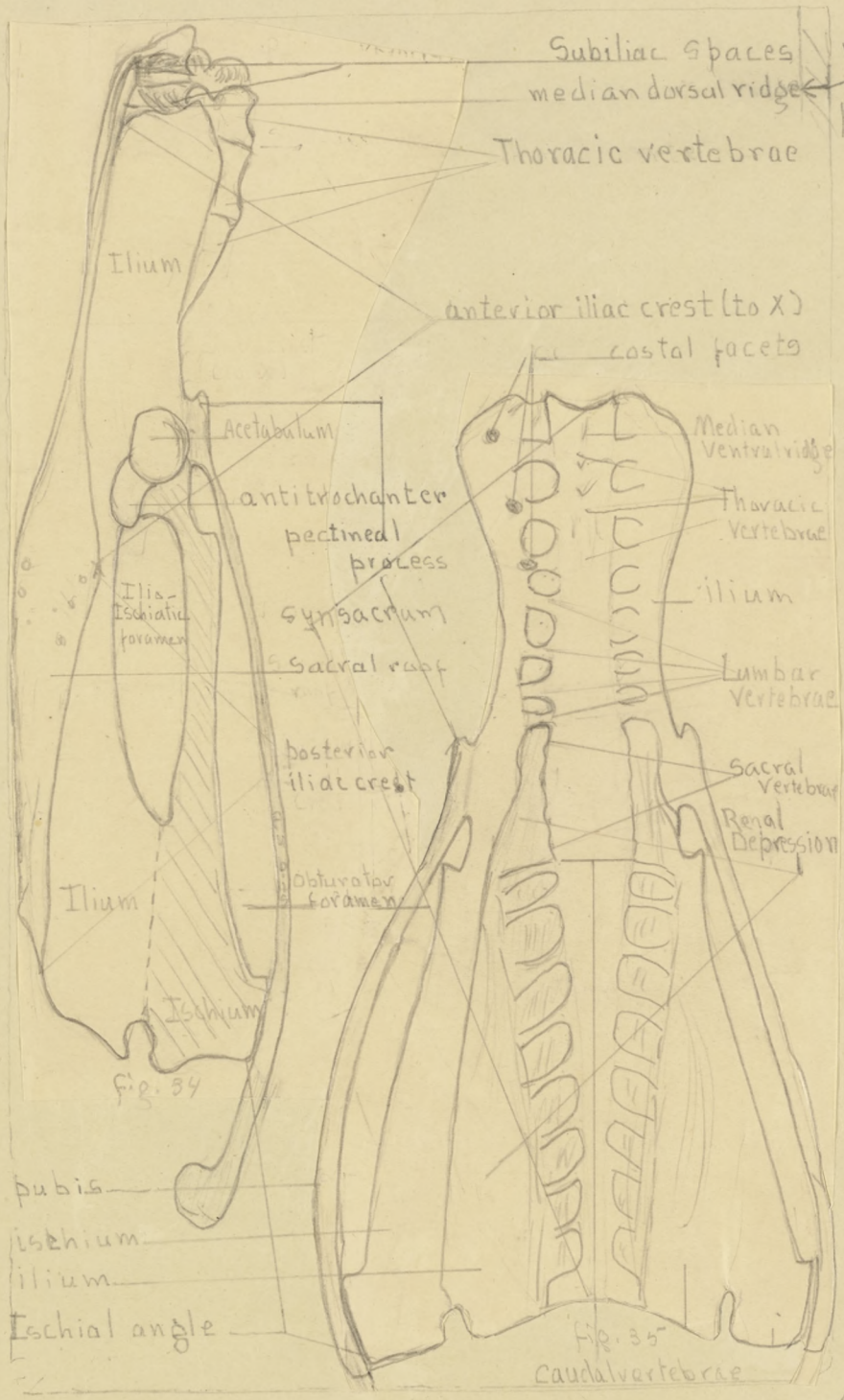


fig. 34

fig. 35

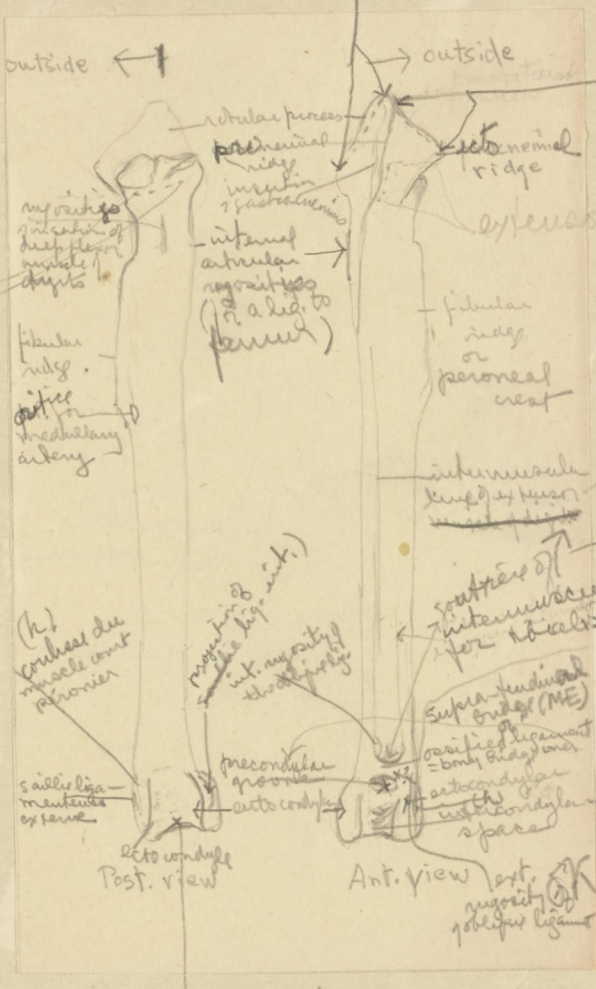
more in to make plate 4 5/16 inches

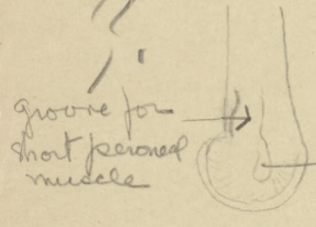
7 1/2

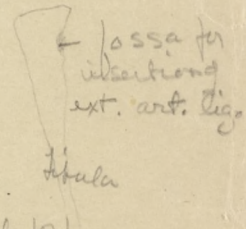
Pelvis of Chen hyperboreus
Figure 34 lateral view;
Figure 35 ventral view.

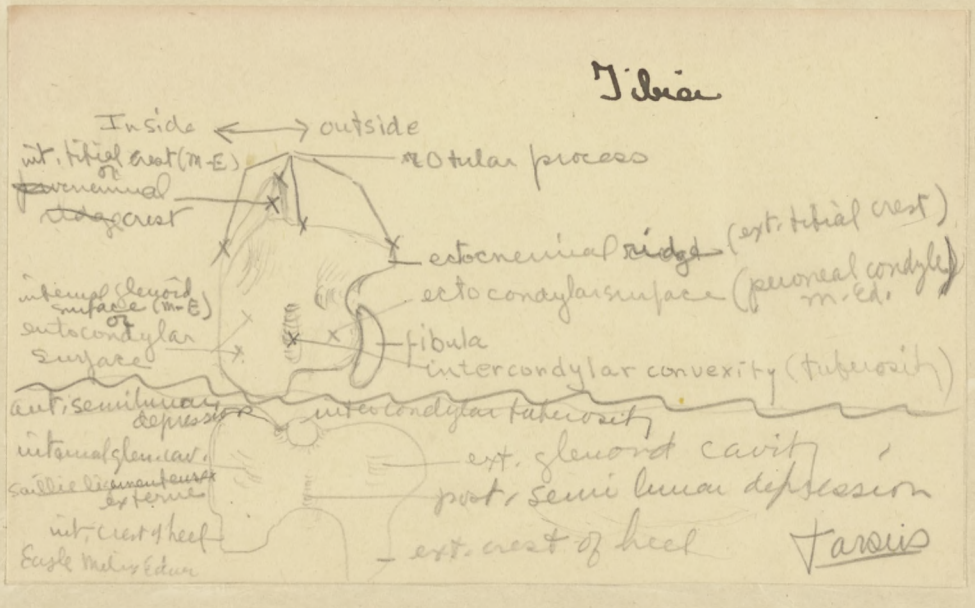
3/16 inch

more up to allow space for caption


sartorius muscle, along here
outside
outside
extensor femoris along this margin
extensor longus digitorum
deep flexor in front
tibial ridge or peroneal crest
longus digitorum
tendinal groove
(anterior)
Post. view
Ant. view
poet. intercondylar groove


groove for short peroneal muscle
process for ext. lig.
ligamental attachment.


fossa for insertion ext. ant. lig.
fibula
tub. for insertion of Biceps crural (Biceps flexor cruris)

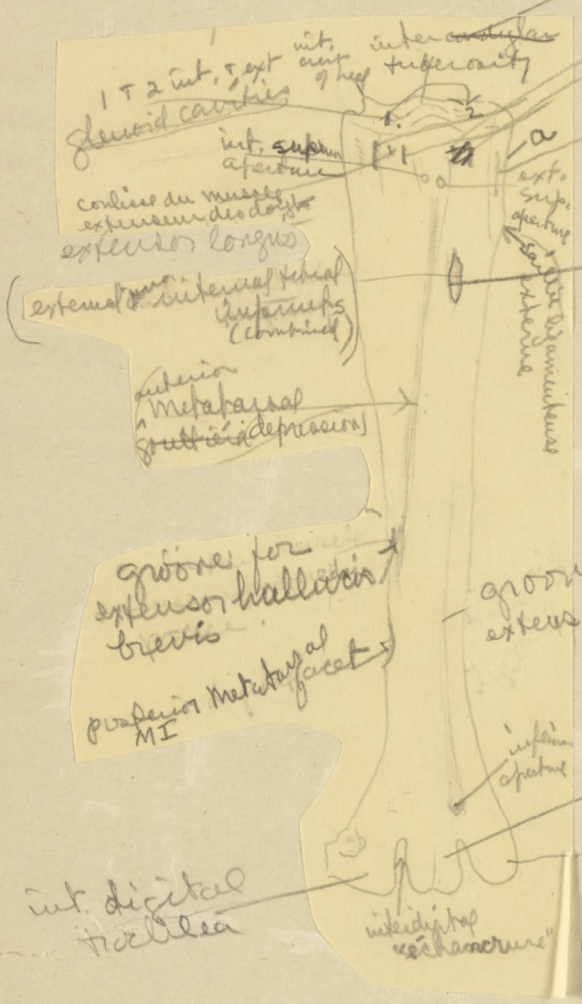

Tibia
Inside
outside
int. tibial crest (M-E)
malleolar process
ectocnemial ridge (ext. tibial crest)
ecto condylar surface (peroneal condyle) m.ed.
fibula
intercondylar convexity (tuberosity)
intercondylar tuberosity
ext. glenoid cavity
post. semilunar depression
ext. crest of heel
Tarsus

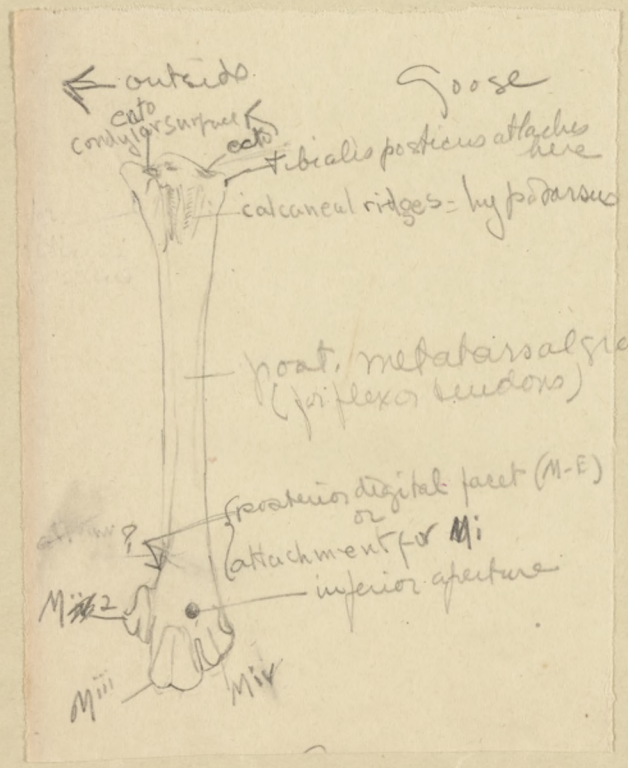
~~astylus~~

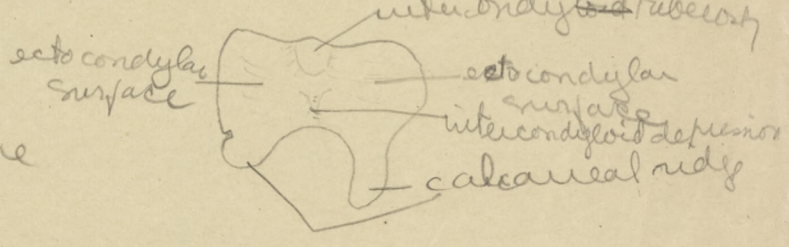
intra-stylar prominence

ligamental attachment of tibialis posticus (on the external side)

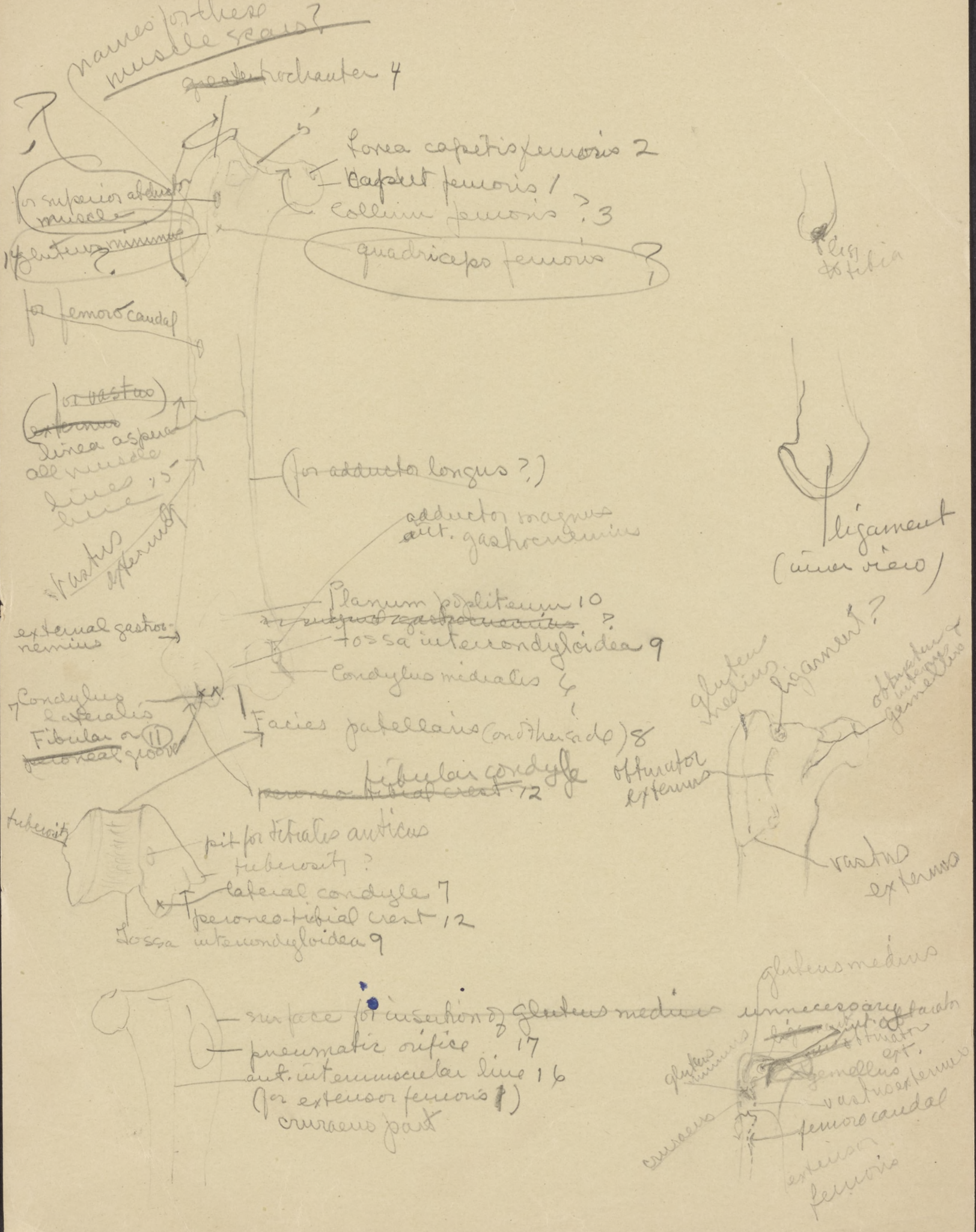
impression of tibialis anticus







tendinal canals in hypotarsus (for flexor tendons of toes)


names for these muscle scars?
greater trochanter 4
fovea capitis femoris 2
Impress. fem. 1
collum femoris ? 3
quadriceps femoris ?
fig. of tibia
fig. femoro caudal
(or vastus)
external
linea aspera
all muscle lines ; 5
lines
vastus externus
(or adductor longus ?)
adductor magnus
aut. gastrocnemius
ligament (annular)
Planum popliteum 10
external gastrocnemius
fossa intercondyloidea 9
Condylus medialis 6
Condylus lateralis 7
Fibular or peroneal groove 11
Facies patellaris (articulated) 8
fibular condyle
peroneo tibial crest 12
obturator externus
glutens medius ligament ?
obturator internus gemellus
tuberosity
pit for tibialis anticus
tuberosity ?
lateral condyle 7
peroneo-tibial crest 12
fossa intercondyloidea 9
vastus externus
surface for insertion of glutens medius
pneumatic orifice 17
aut. intermuscular line 16
(or extensor femoris ?)
cruraeus part
glutens medius
unnecessary stated
glutens minimus
obturator ext.
gemellus
vastus externus
cruraeus
femoro caudal
extensor femoris

Misc. Notes H + Burt.

Sternum

✓ ~~ventr. border~~ dorsal mandibular spine (change to margin) of mandibular ~~showing both spina sternae~~.

carina - English - change to keel Therioux

✓ ant. carinal margin (notes + label this

✓ dorsal mandibular spine (label dorsal border as such

✓ Sternal plate ~~= body of sternum~~.

furcula

symphysial area (change to symphysis)

Coracoid

✓ bicipital scar change to (attachment)

change all scars to attachments.

✓ change pectoral canal to (triosseal canal)

✓ use furcular in preference to clavicular articulation.

scapula

✓ change articular face to (furcular articulation)

radius

✓ label the shaft

ulna

ext. int. coronal palm.

dissect for biceps + ext. s. meta. pollicis.

└ ligamental attachment (not scar) of carp. tub.

└ put in internal condyle.

└ shaft

✓ change quill papillae to (secondary papillae)

✓ change internal row of papillae to inner

L Pelvis of Pelican - Zeitsch. about 1915

carpus

✓ ligamental scar ♀ (attachment)

✓ extensor " " "

bobby pollex for use ♀ pollical facet.

internal (pisiform knob)

anterior on side of MI

~~Tarsus~~

✓ Tendinal ridge

meta tarsal facet = facet for digit I

✓ number trochlear - 2, 3 & 4,

✓ ant met. furrow = groove

L Talon of hypotarsus - ext ✓ int - = calc. ridges

L wing ✓

Humerus

✓ capital groove = neck furrow

L deltoid ridge instead ♀ crest ♂

L nutrient foramen

~~Sacral rep - shield of pelvis~~

femetra loop eye in dick

pollex

mandible

Loss of Parker for ~~External~~ external articular process
external articular process
coronoid process

Pelvis

✓ sacral roof = shield of pelvis
✓ ventral ridge = crest

✓ patellar
ratular

Femur { ligamentum teres
✓ fibular groove = furrow
✓ nutrient foramen
shaft.

Tibia ~~fibula~~ tarsus
shaft.

✓ fibula head ✓ spine

=

Skull

└ maris - singular?

└ nasal process of ore max
└ maxillo palatines
trans palatine process

└ basi pterygoid process
✓ openings for Eustachian tubes
✓ mesethmoid = ethmoid
maxillary process of zygomatic

(Percy Lowe - vent numbers of P.Z.S. on Quadrate.)

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by HILDEGARDE HOWARD

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No. 330, September 1980
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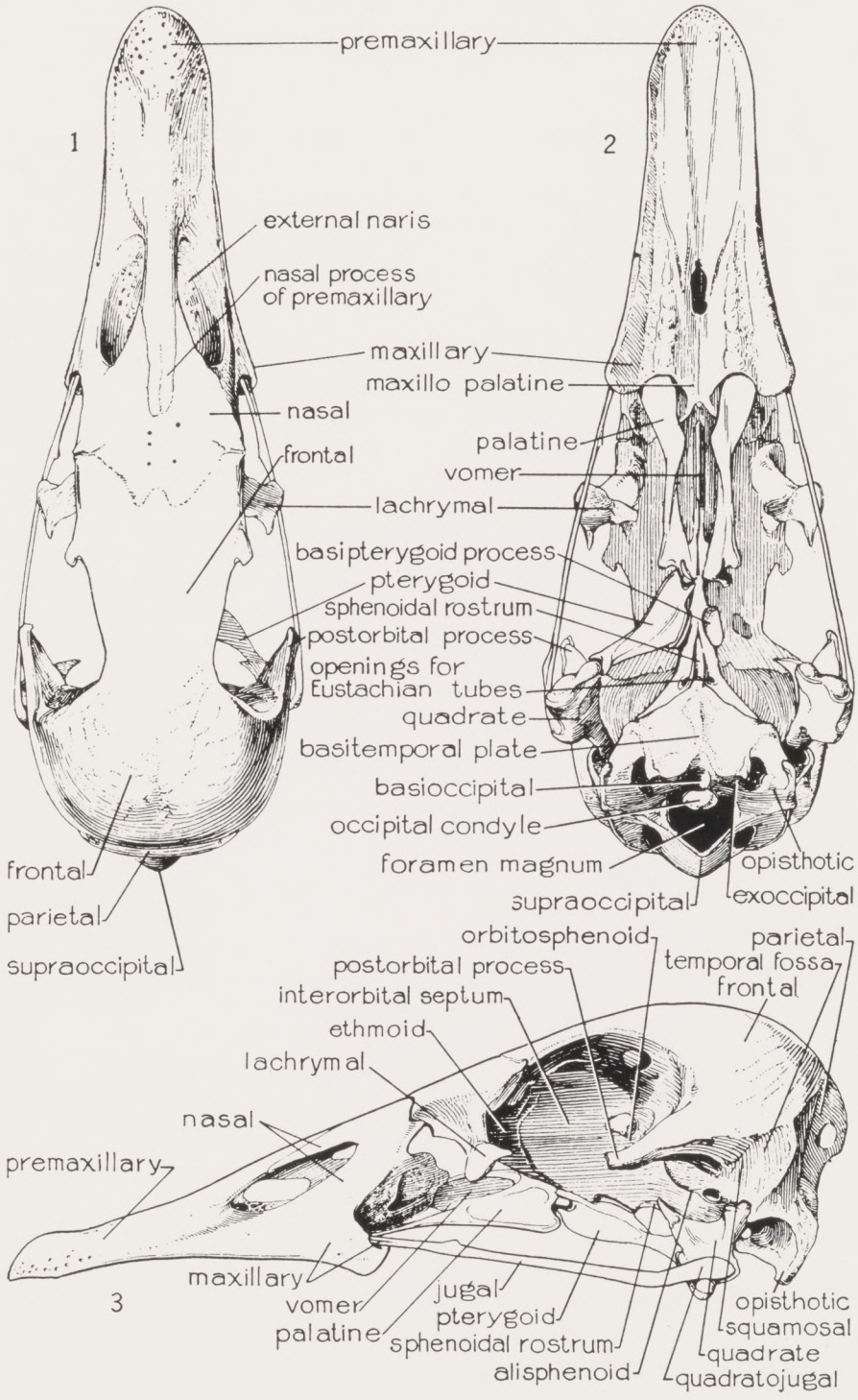
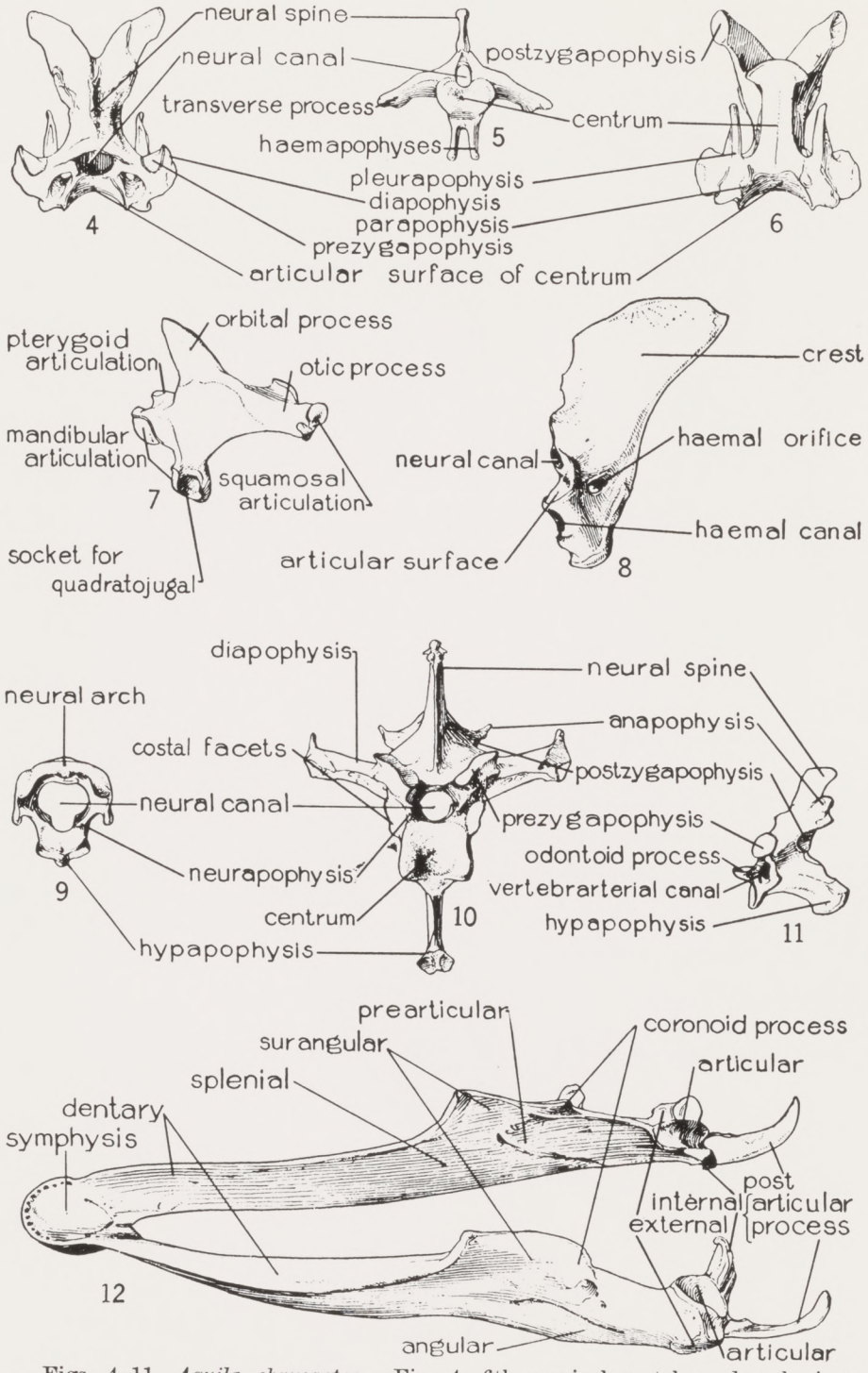
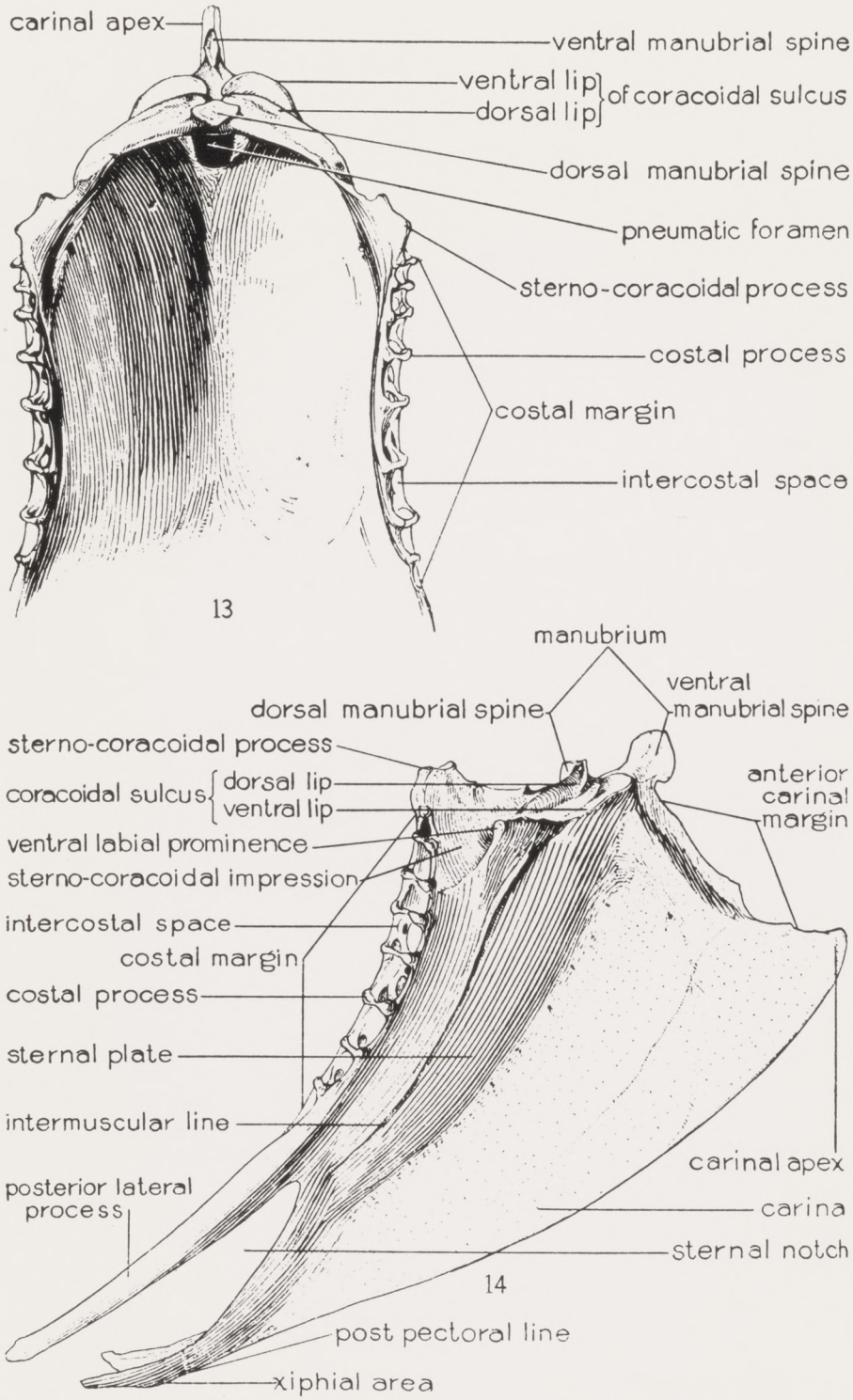


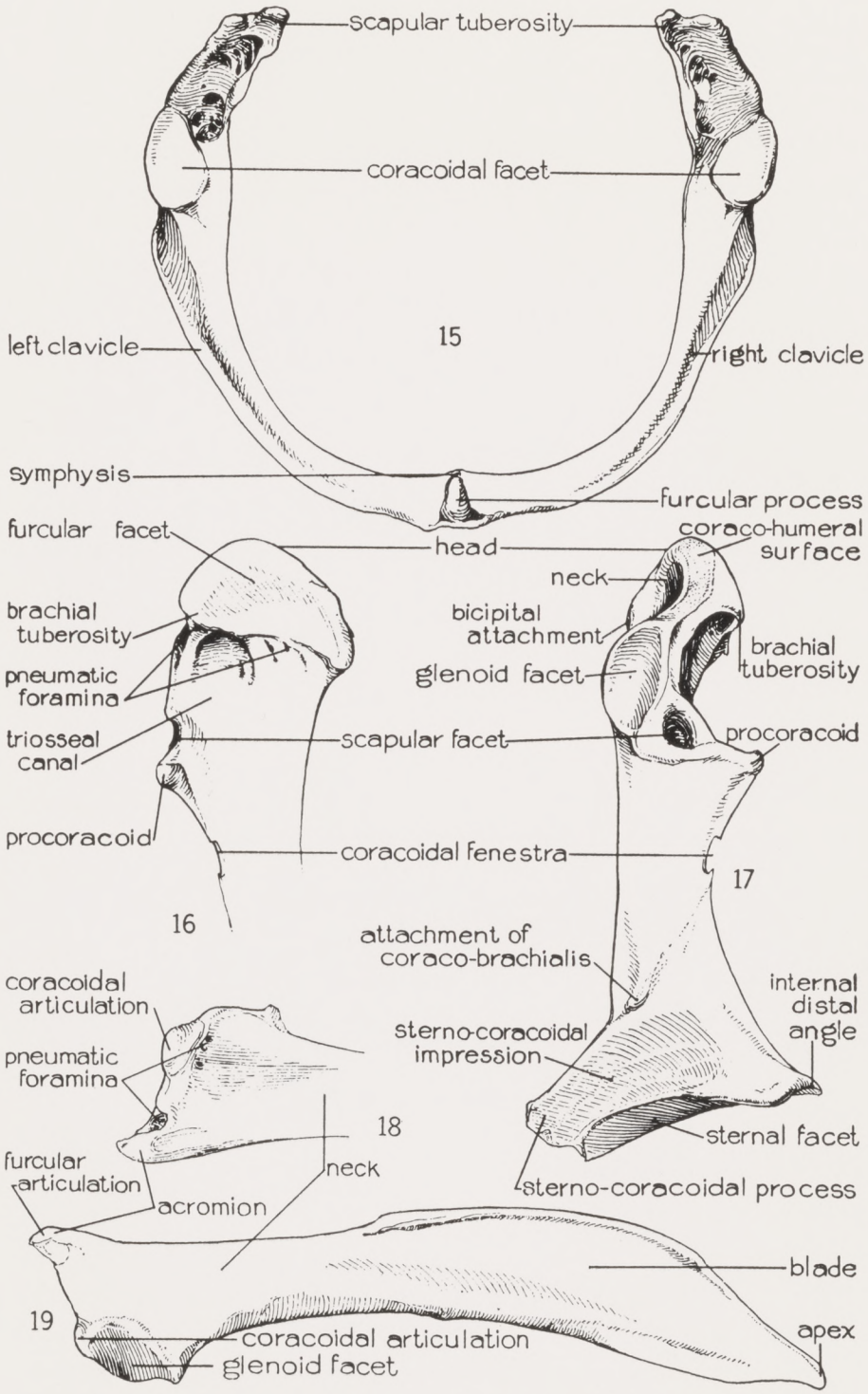
Skull of *Chen hyperboreus*. Fig. 1, dorsal view; fig. 2, ventral view; fig. 3, lateral view. × 1.



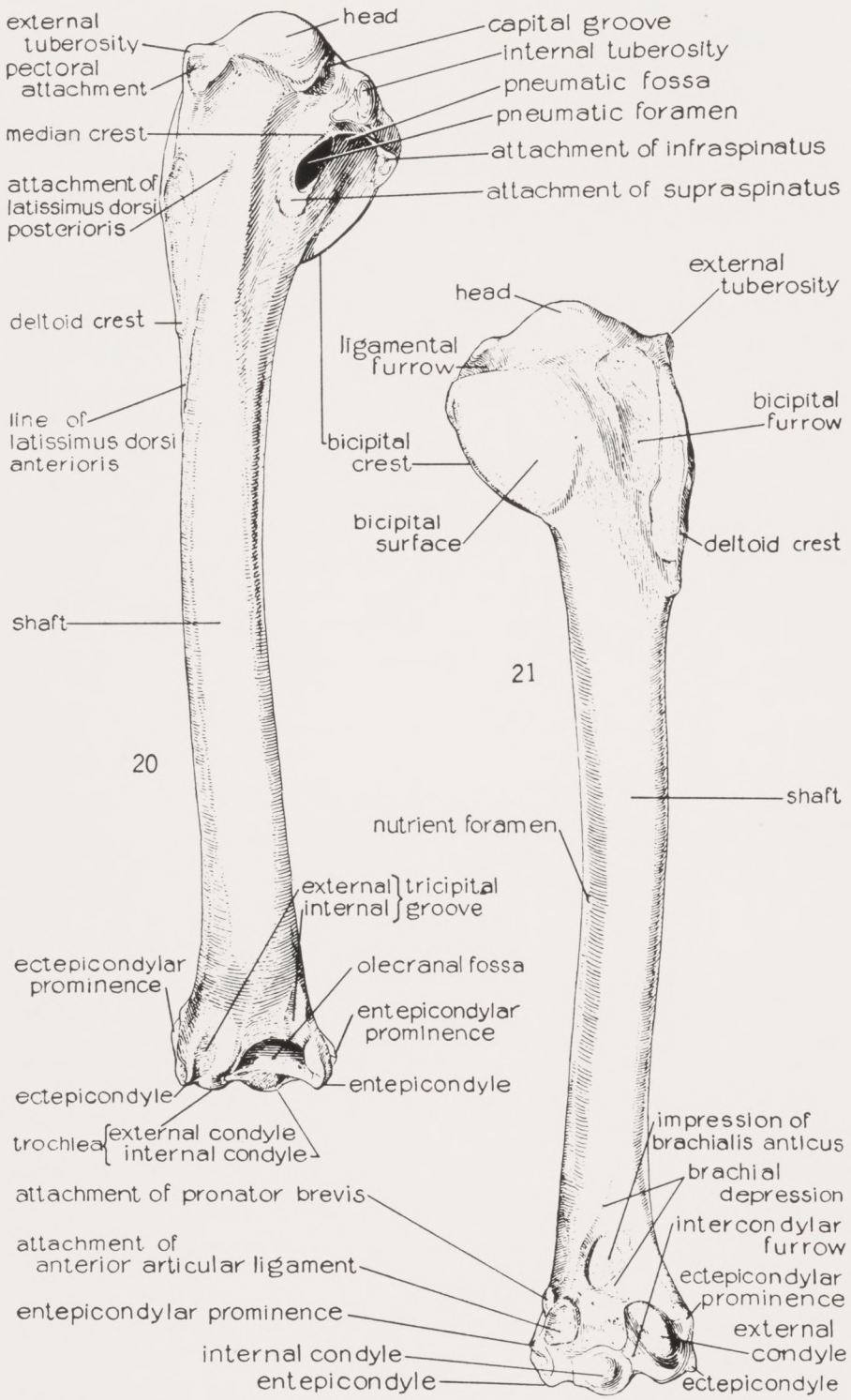
Figs. 4–11, *Aquila chrysaetos*. Fig. 4, 6th cervical vertebra, dorsal view; fig. 5, caudal vertebra, anterior view; fig. 6, 6th cervical vertebra, ventral view; fig. 7, left quadrate, external view; fig. 8, pygostyle; fig. 9, atlas, posterior view; fig. 10, 4th thoracic vertebra, anterior view; fig. 11, axis, left side; fig. 12, *Chen hyperboreus*, mandible. × 1.



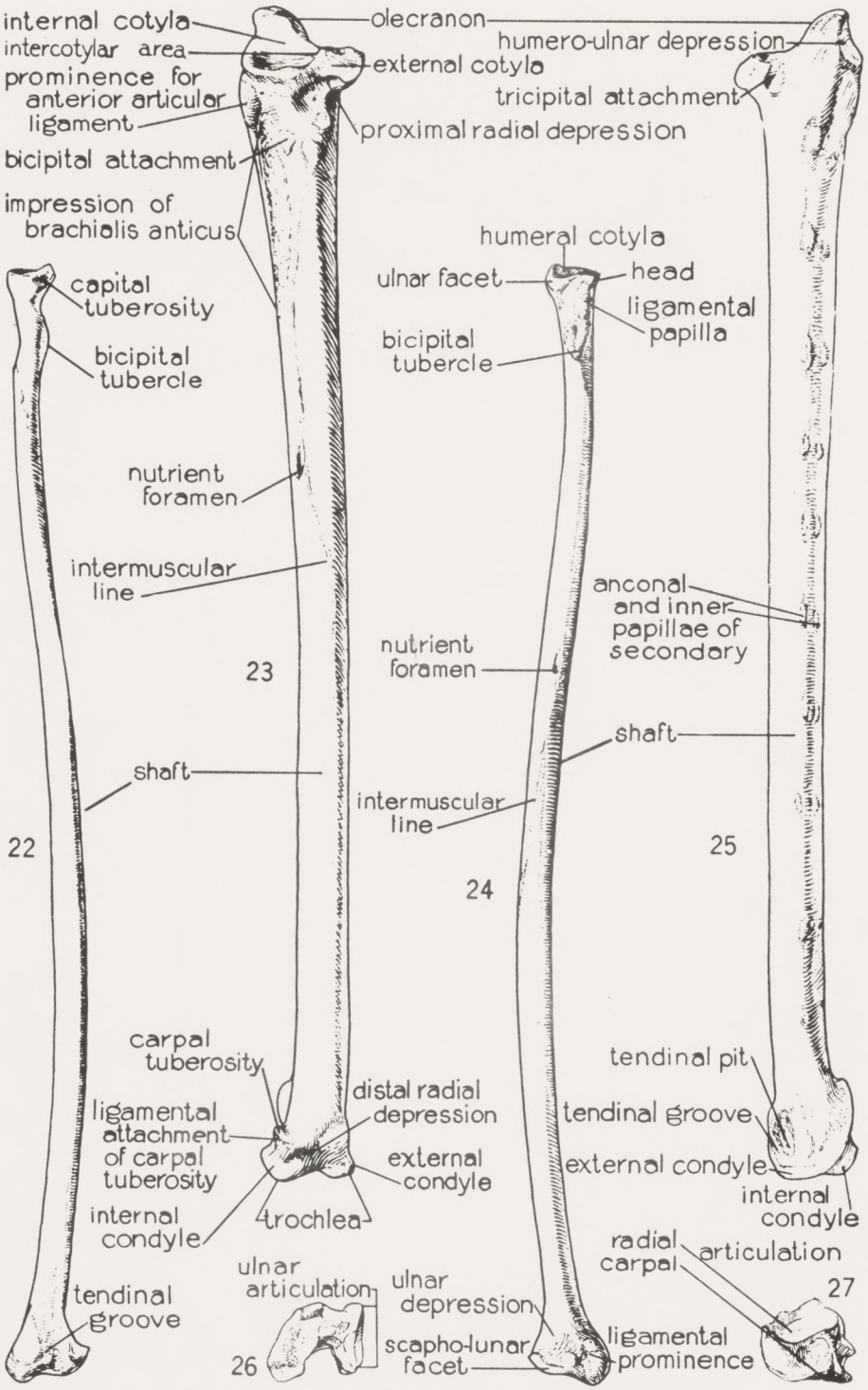
Sternum of *Chen hyperboreus*. Fig. 13, dorsal view; fig. 14, lateral view. × 1.



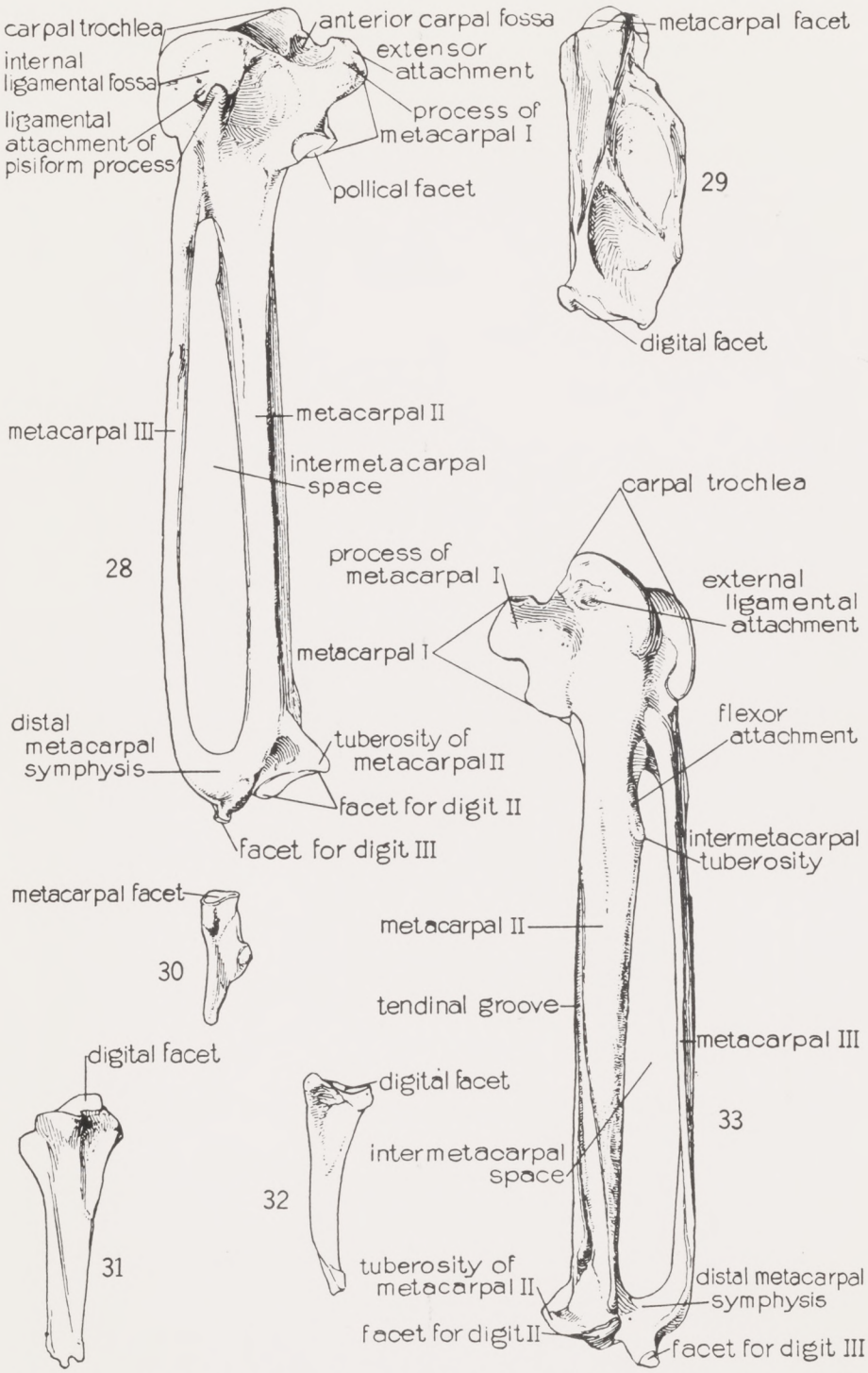
Aquila chrysaetos. Fig. 15, furcula, dorsal view; fig. 16, coracoid, internal view; fig. 17, coracoid, dorsal view; fig. 18, scapula, ventral view; fig. 19, scapula, dorsal view. × 1.



Humerus of *Chen hyperboreus*. Fig. 20, anconal view; fig. 21, palmar view. × 1.



Aquila chrysaetos. Fig. 22, radius, anconal view; fig. 23, ulna, palmar view; fig. 24, radius, palmar view; fig. 25, ulna, anconal view; fig. 26, cuneiform; fig. 27, scapholunar. Figs. 22–25 × ⅔; figs. 26–27 × 1.



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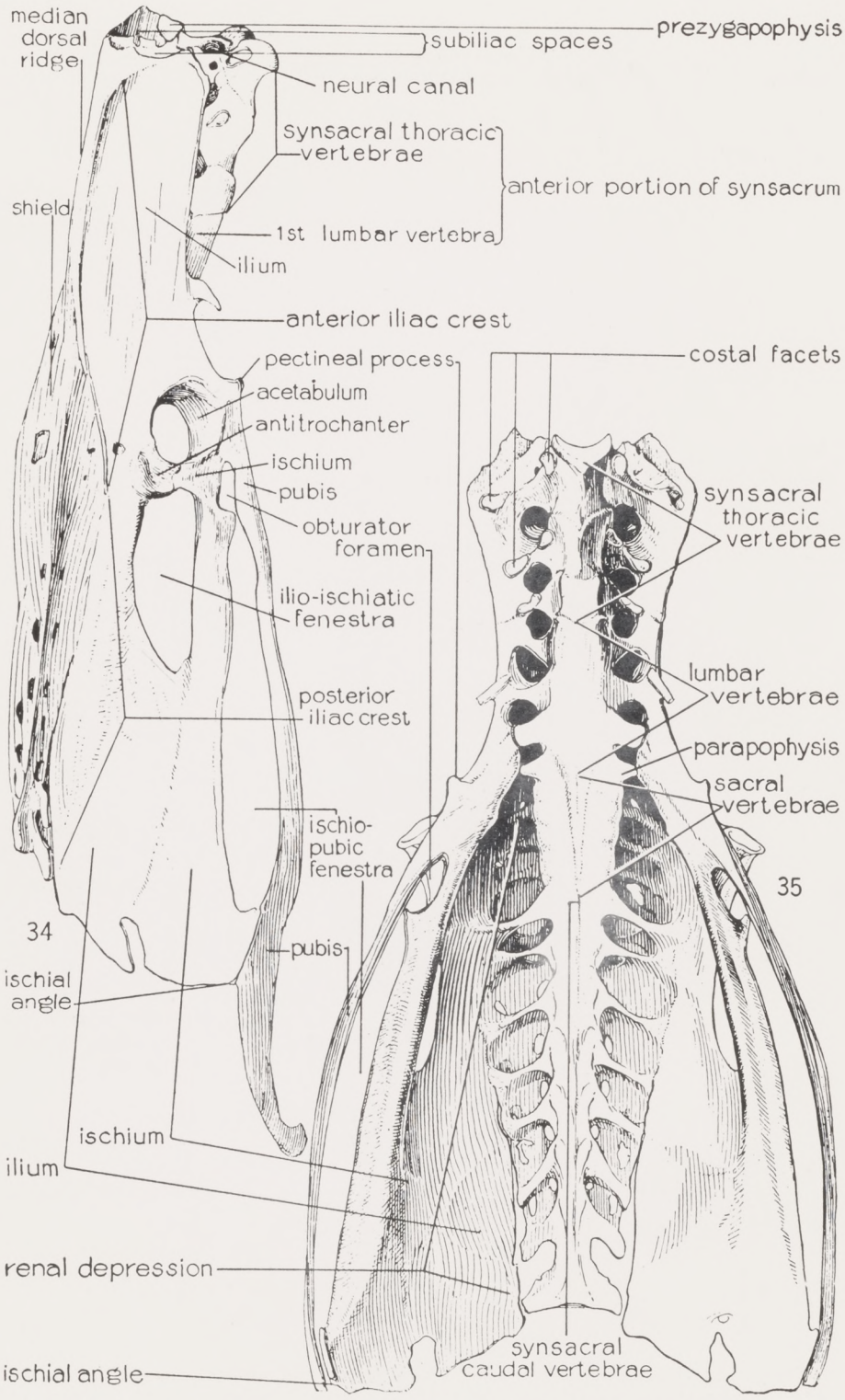
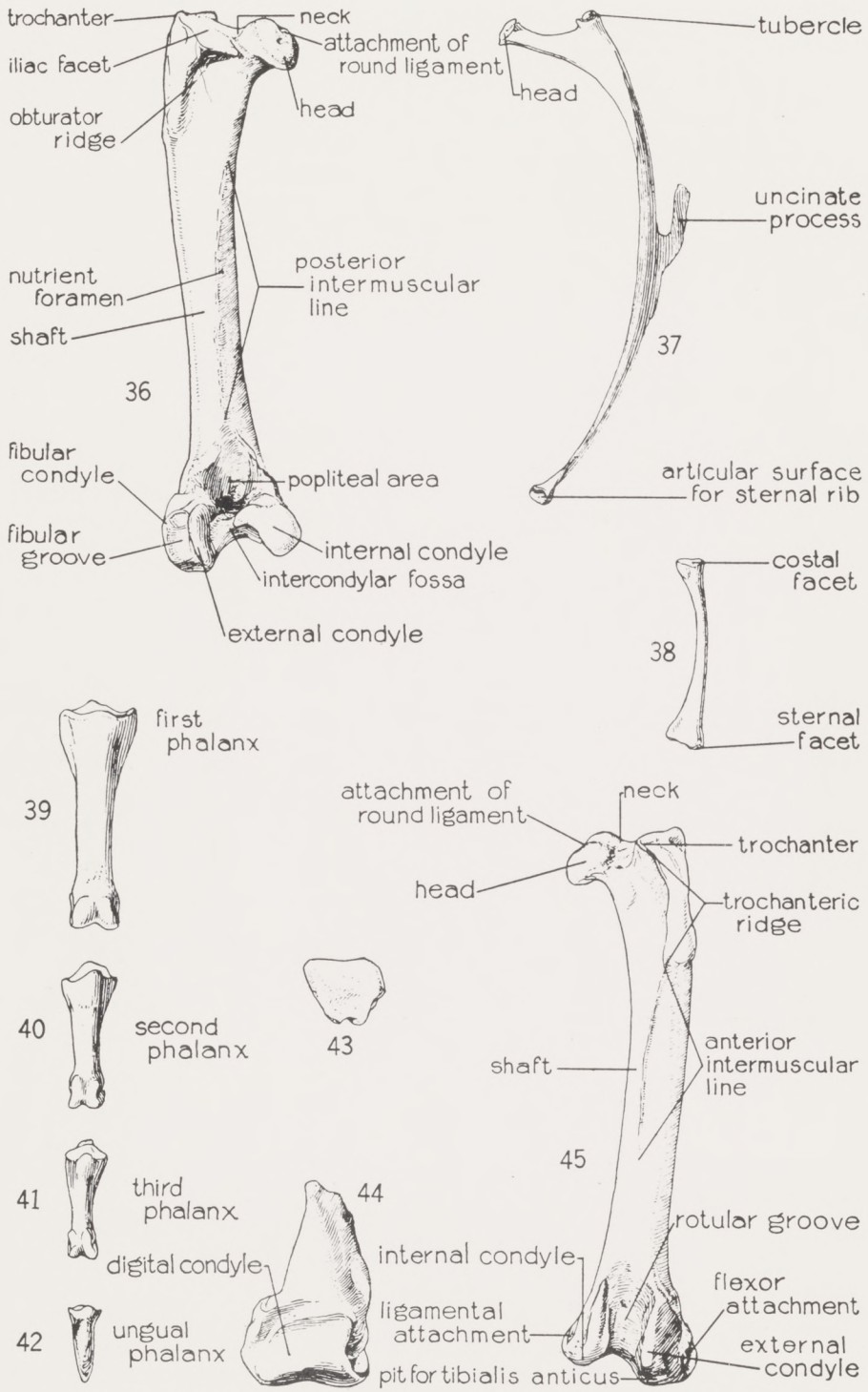
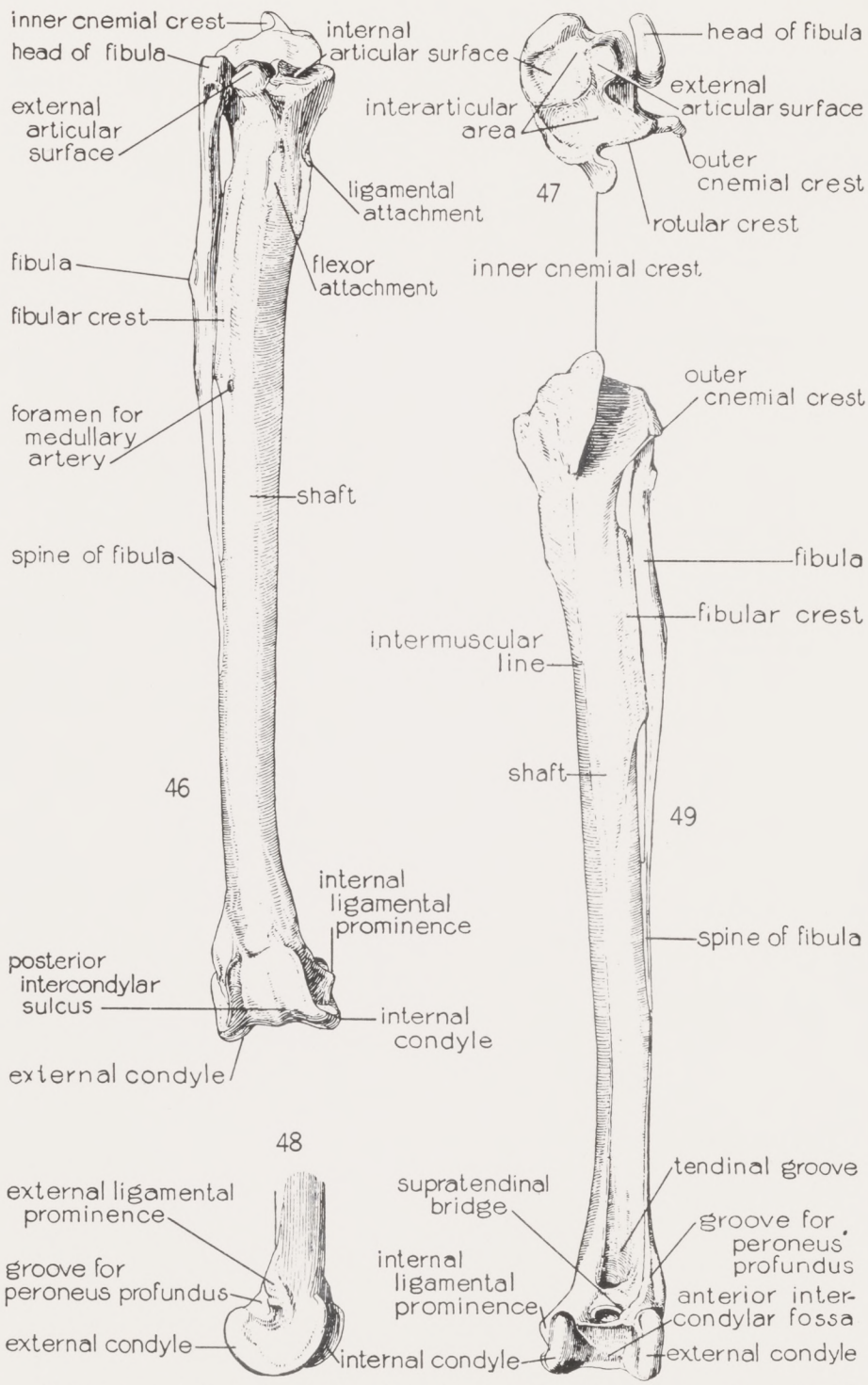


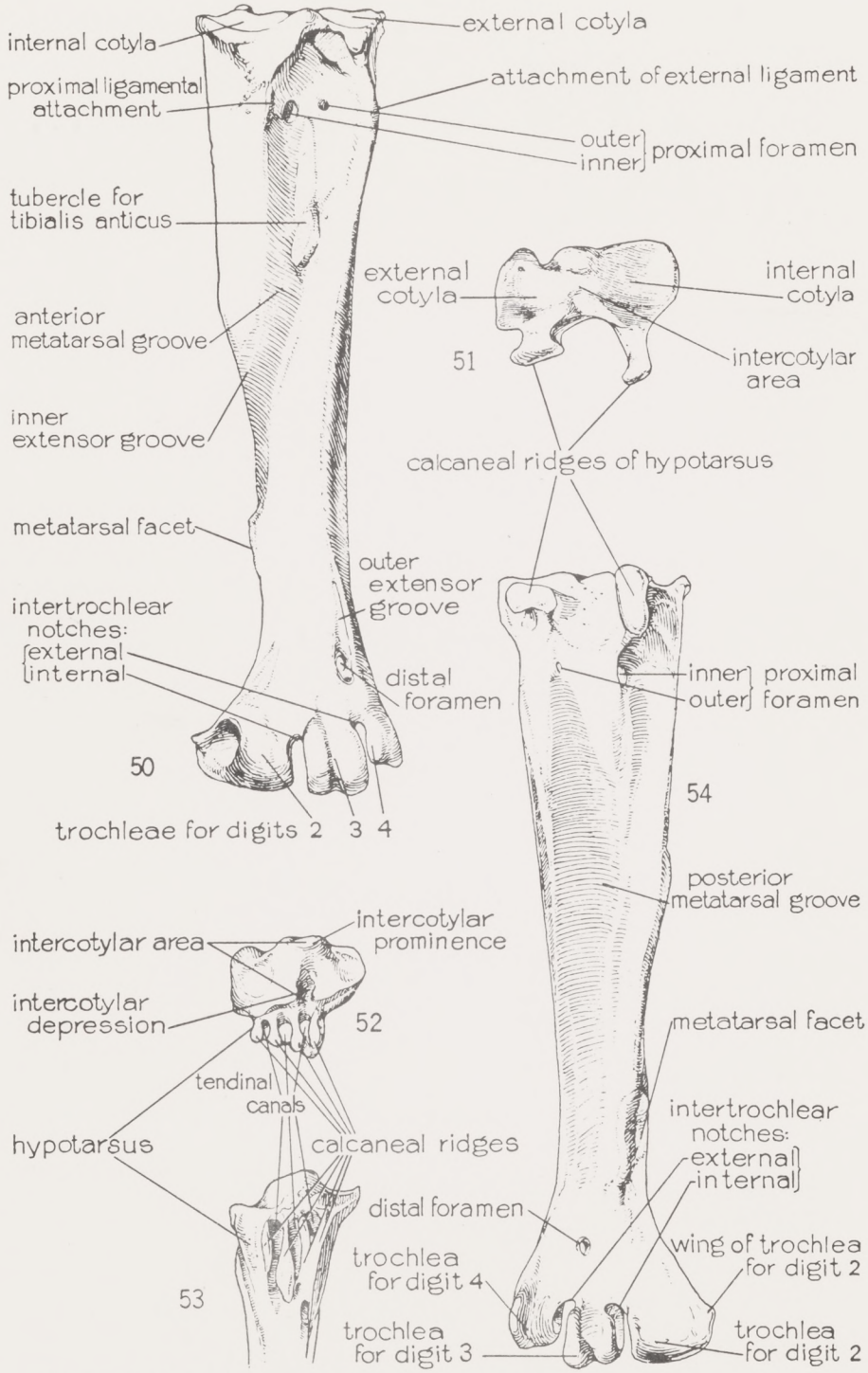
Pelvis of *Chen hyperboreus*. Fig. 34, lateral view; fig. 35, ventral view. × 1.



Figs. 36–42 and fig. 45, *Chen hyperboreus*; figs. 43–44, *Aquila chrysaetos*. Fig. 36, femur, posterior view; figs. 37–38, rib and sternal rib no. 4; figs. 39–42, digit 3 of pes; fig. 43, patella; fig. 44, metatarsal I; fig. 45, femur, anterior view. × 1.



Tibiotarsus and fibula of *Chen hyperboreus*. Fig. 46, posterior view; fig. 47, proximal end, proximal view; fig. 48, distal end, external view; fig. 49, anterior view. × 1.



Tarsometatarsus. Figs. 50, 51 and 54, *Aquila chrysaetos*; figs. 52–53, *Chen hyperboreus*. Fig. 50, anterior view; figs. 51 and 52, proximal end, proximal view; fig. 53, proximal end, posterior view; fig. 54, posterior view. × 1.

CS 330R1

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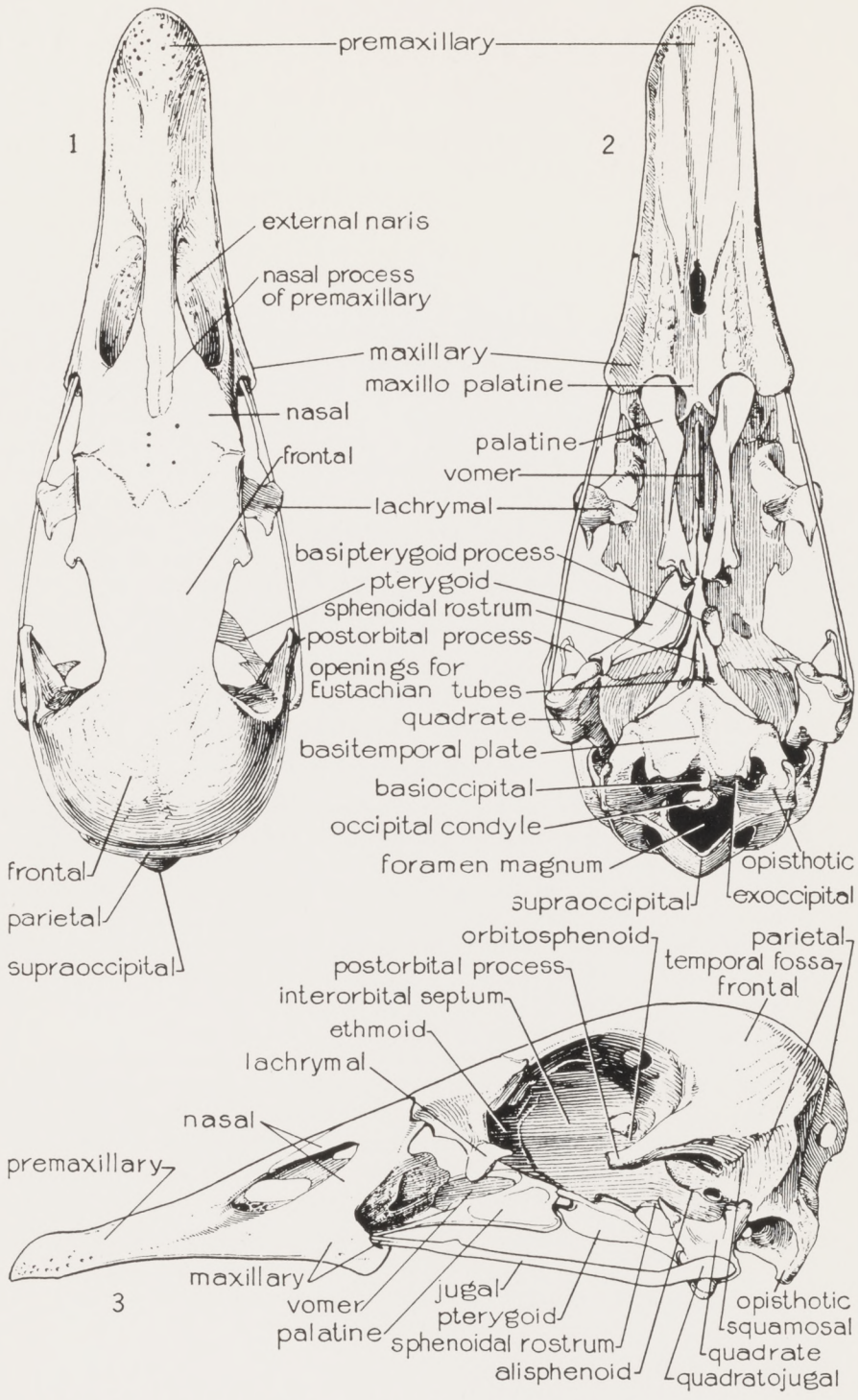

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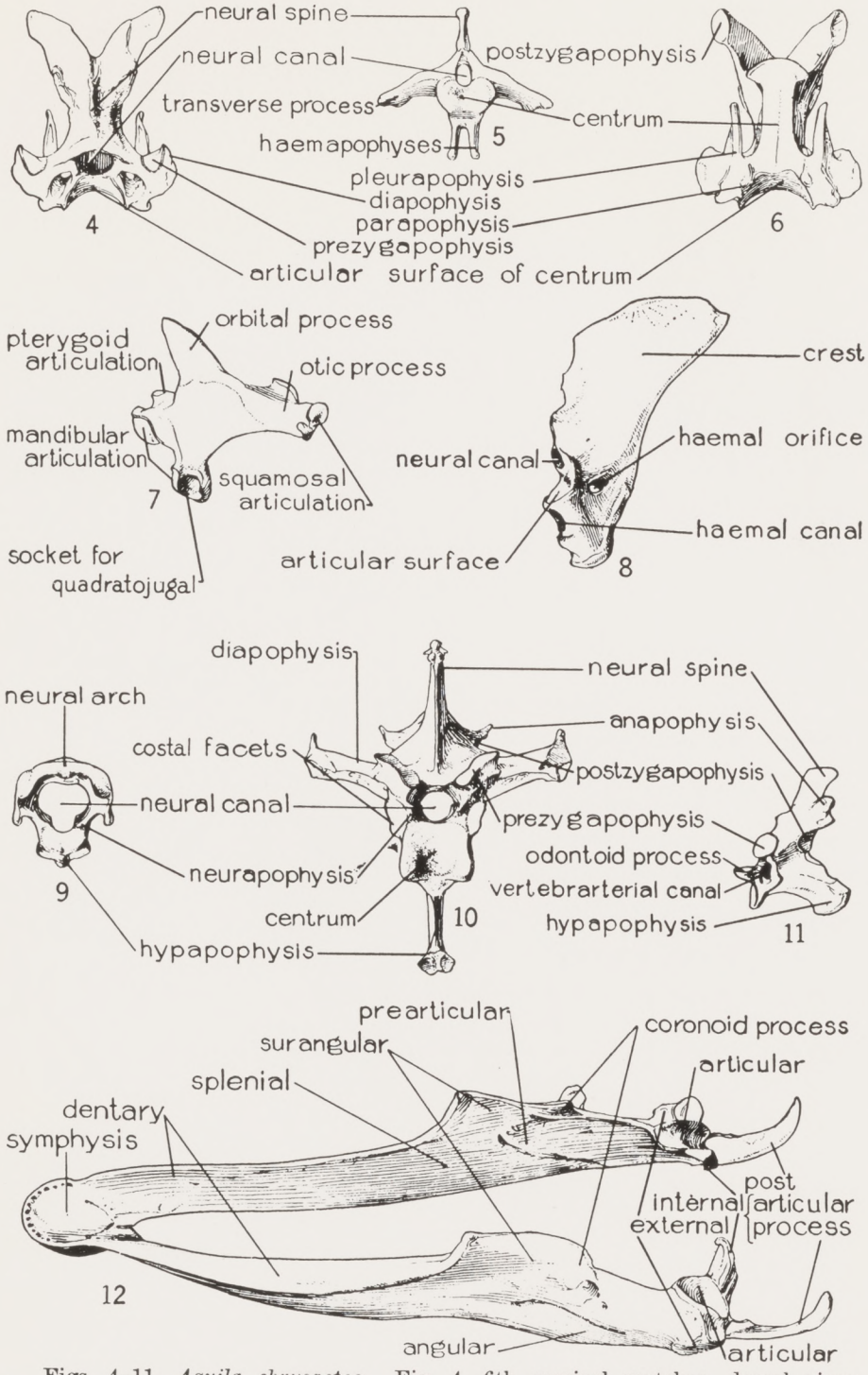

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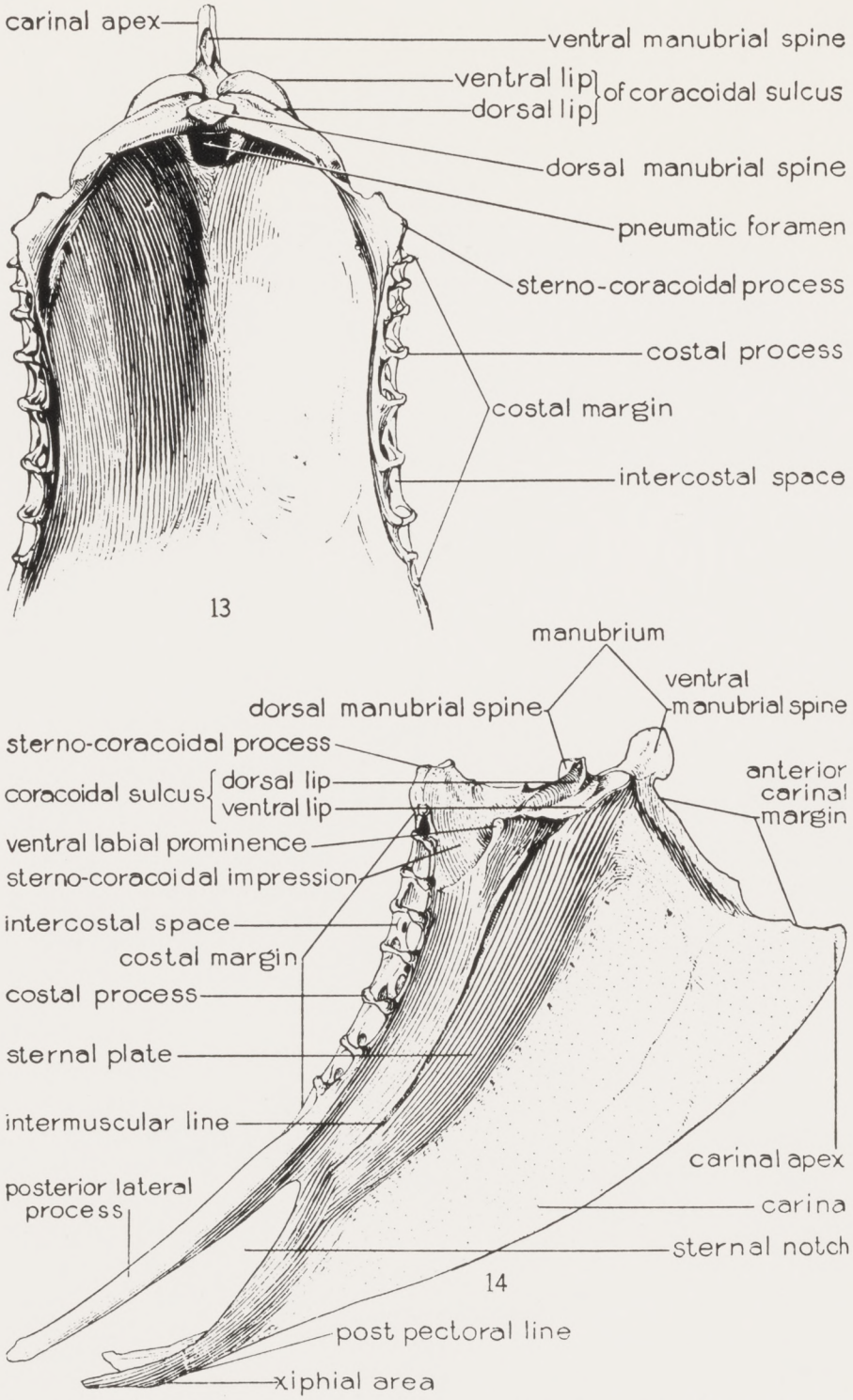

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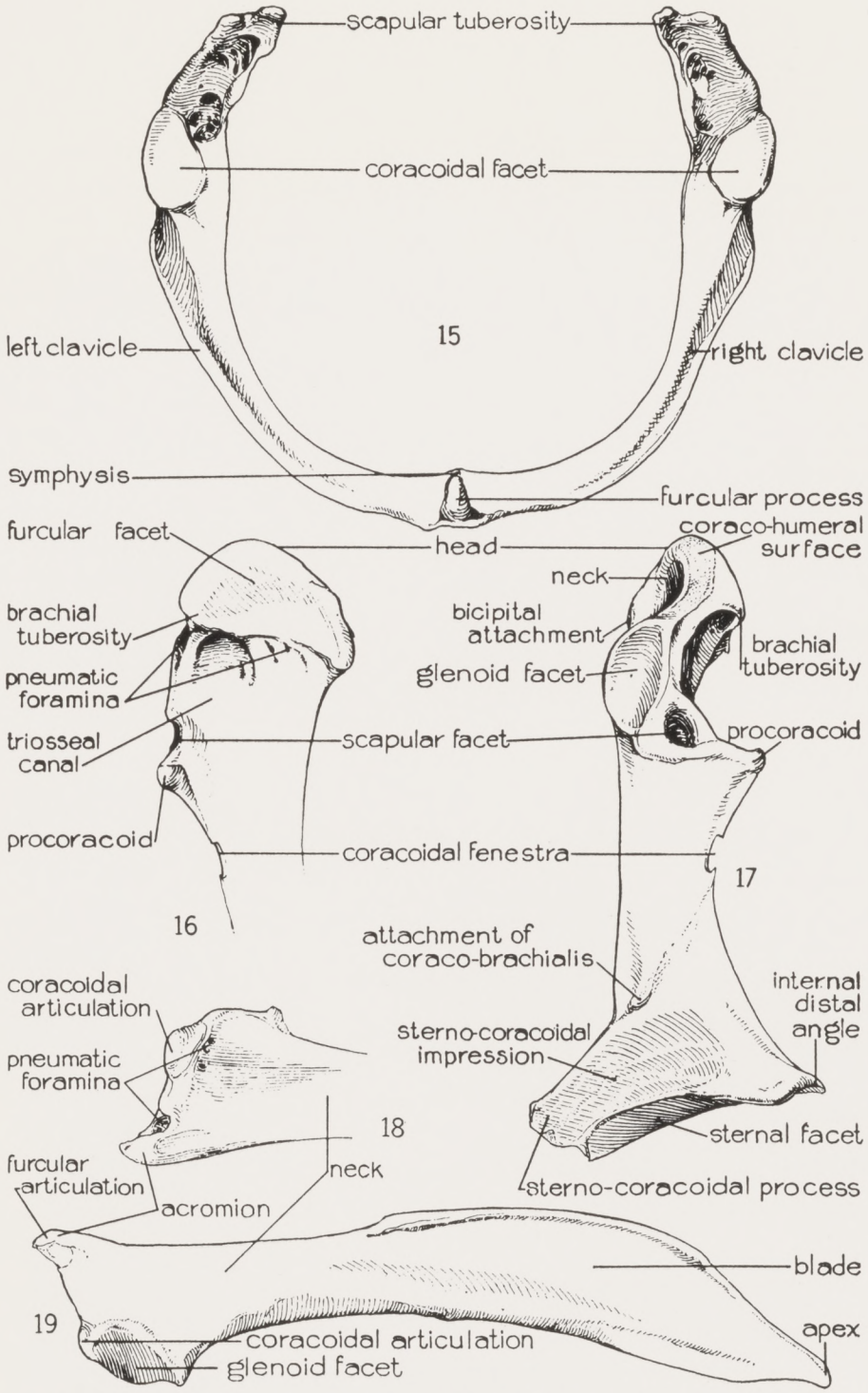

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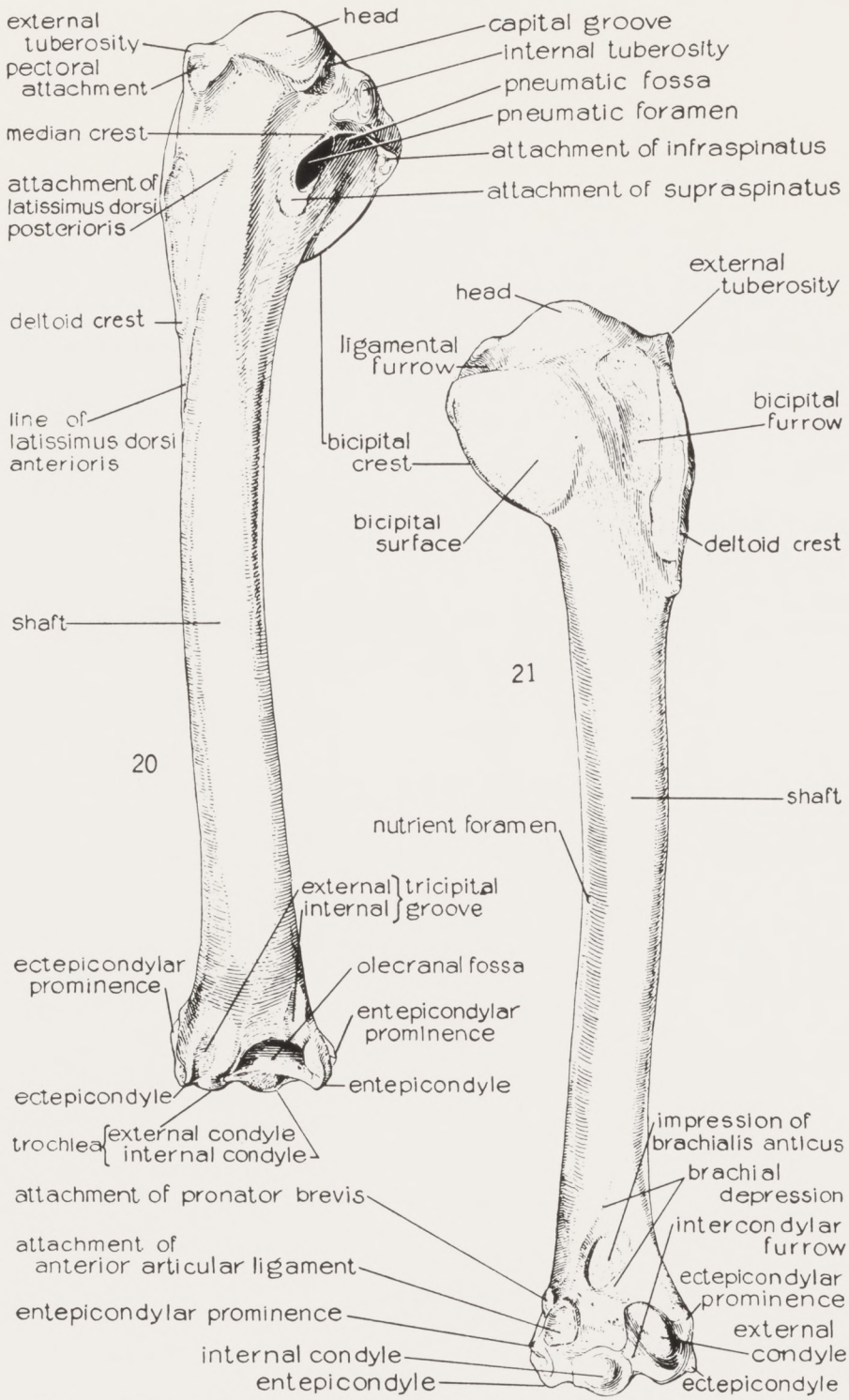

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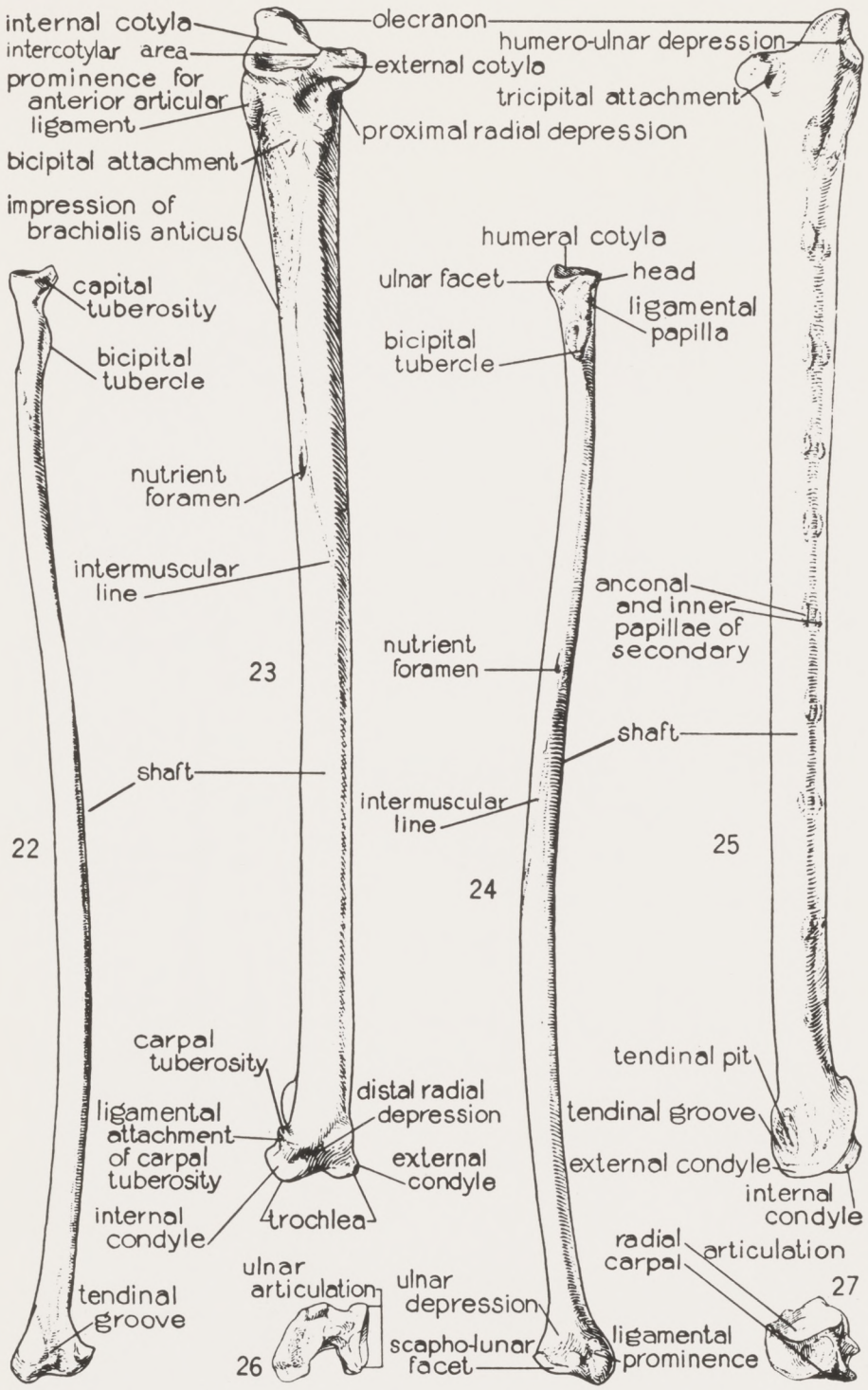

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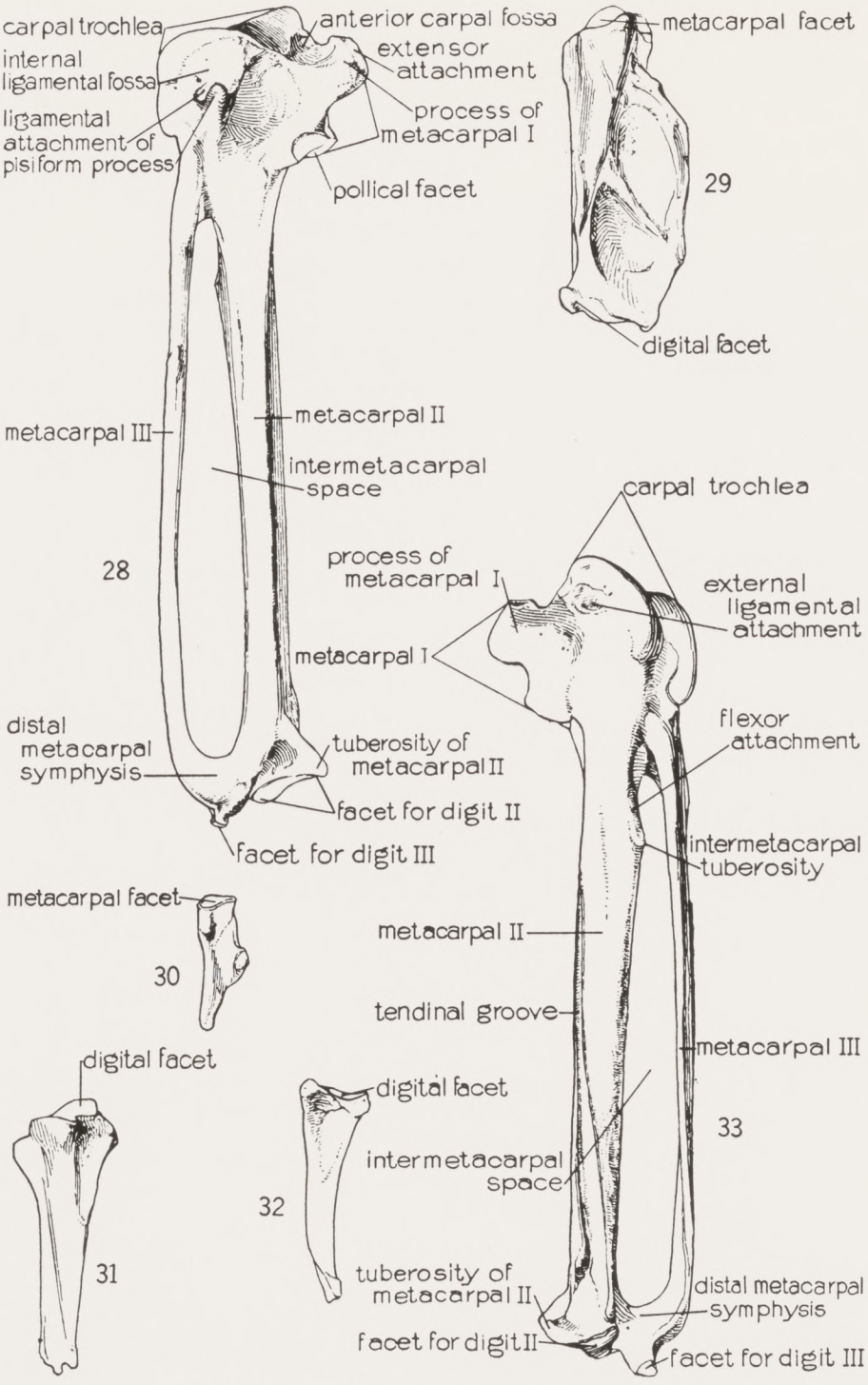
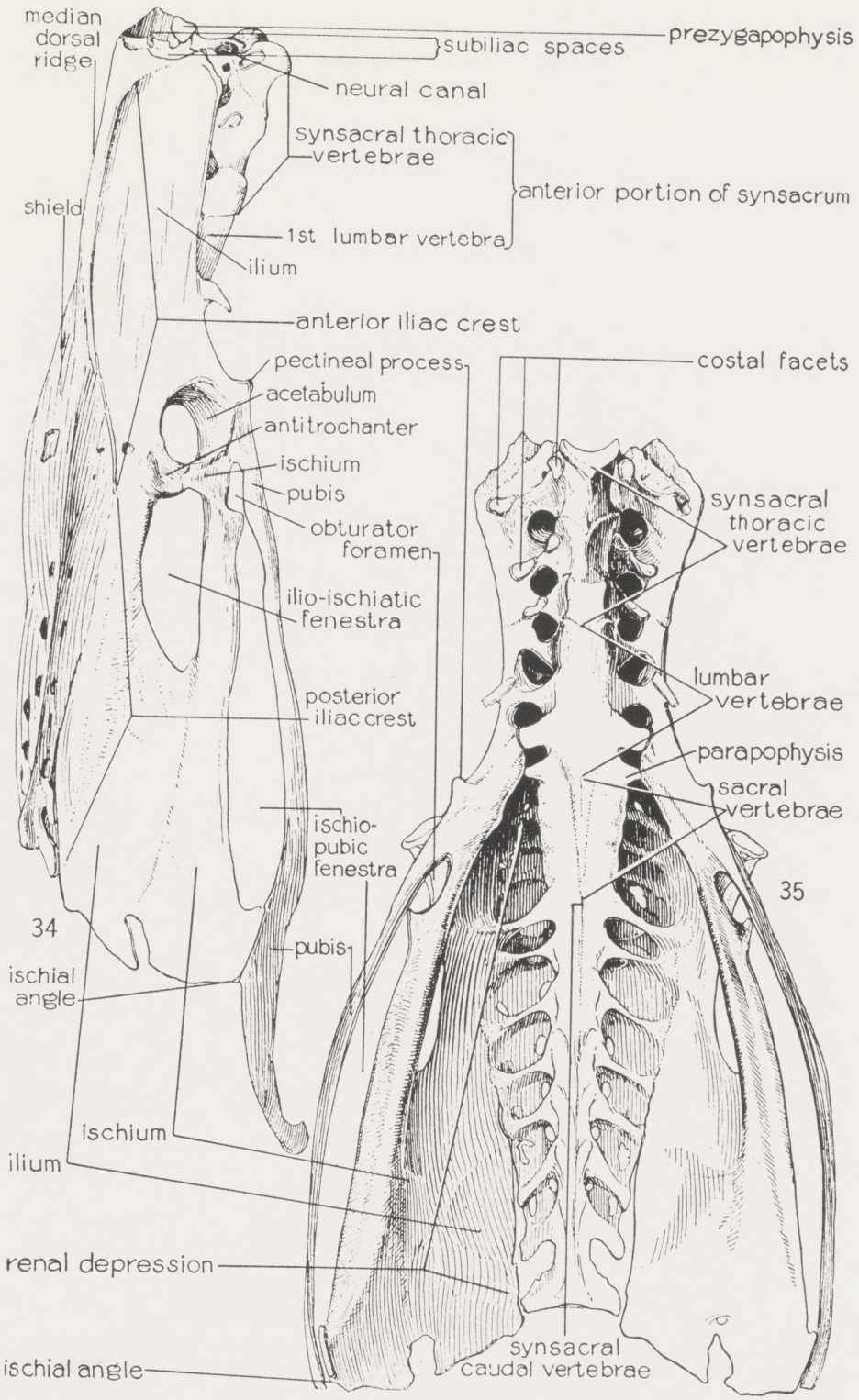
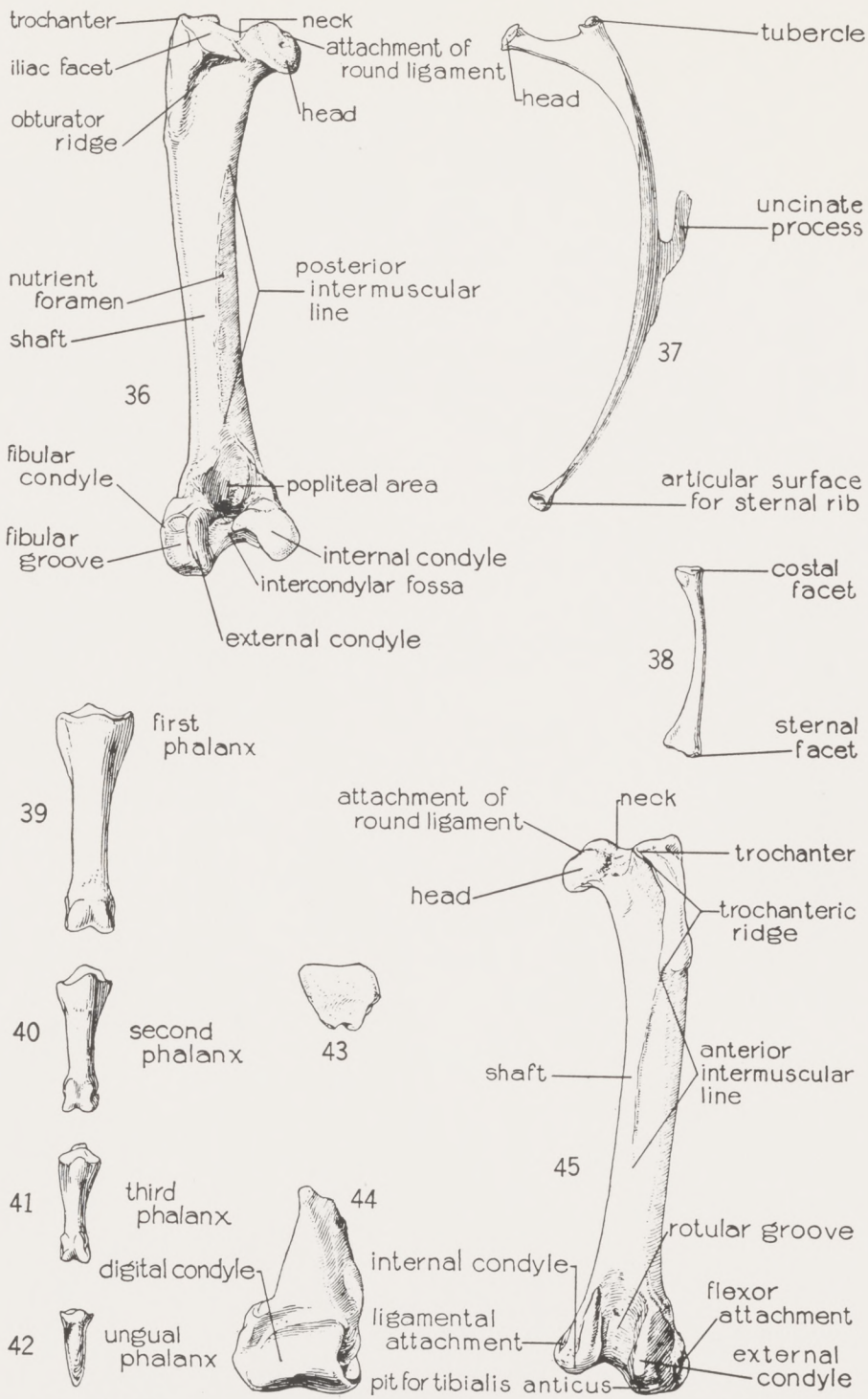


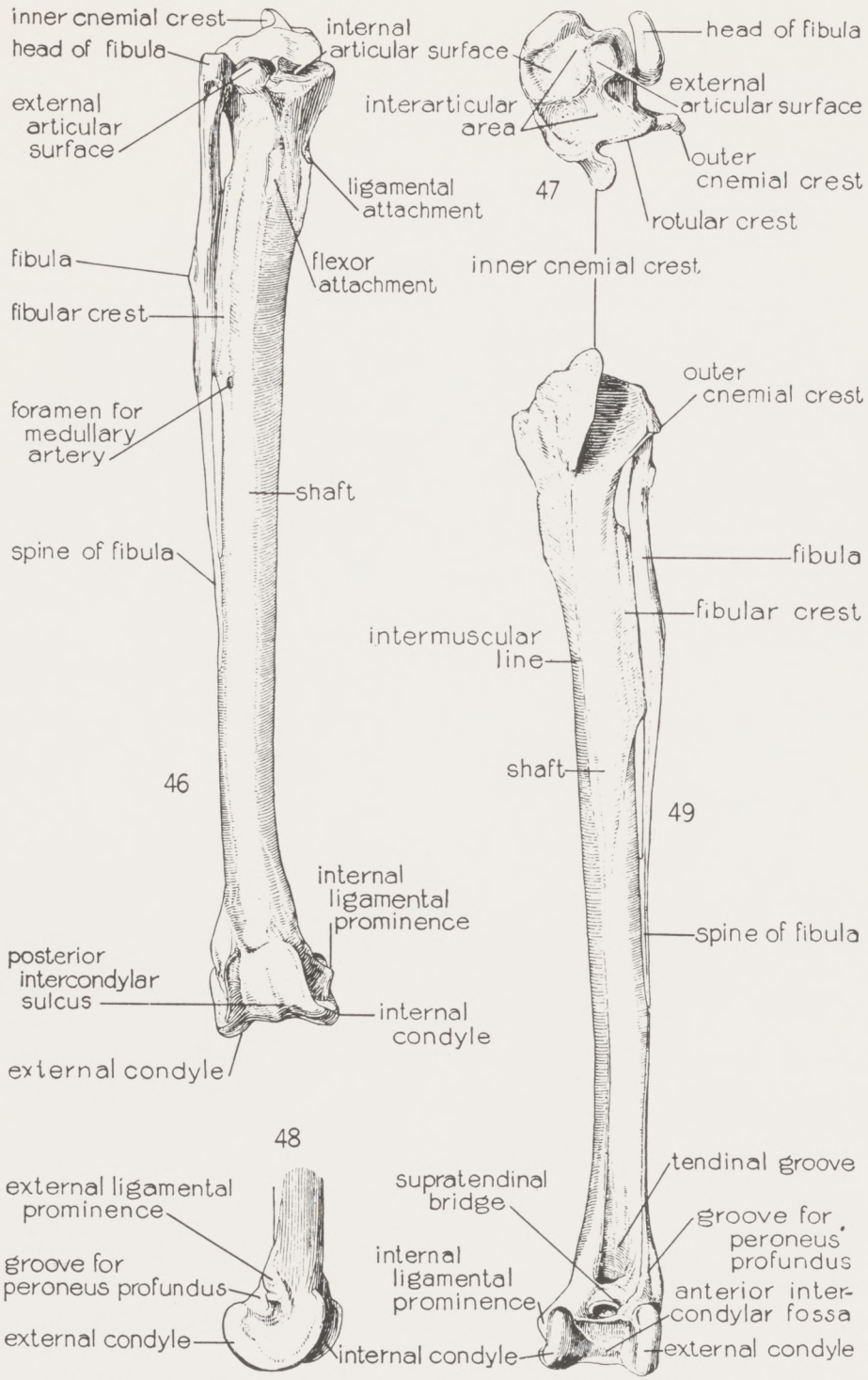
Aquila chrysaetos. Fig. 28, carpometacarpus, internal view. figs. 29–32, phalanges of manus: fig. 29, digit 2, phalanx 1; fig. 30, digit 3; fig. 31, pollex; fig. 32, digit 2, phalanx 2; fig. 33, carpometacarpus, external view. × 1.



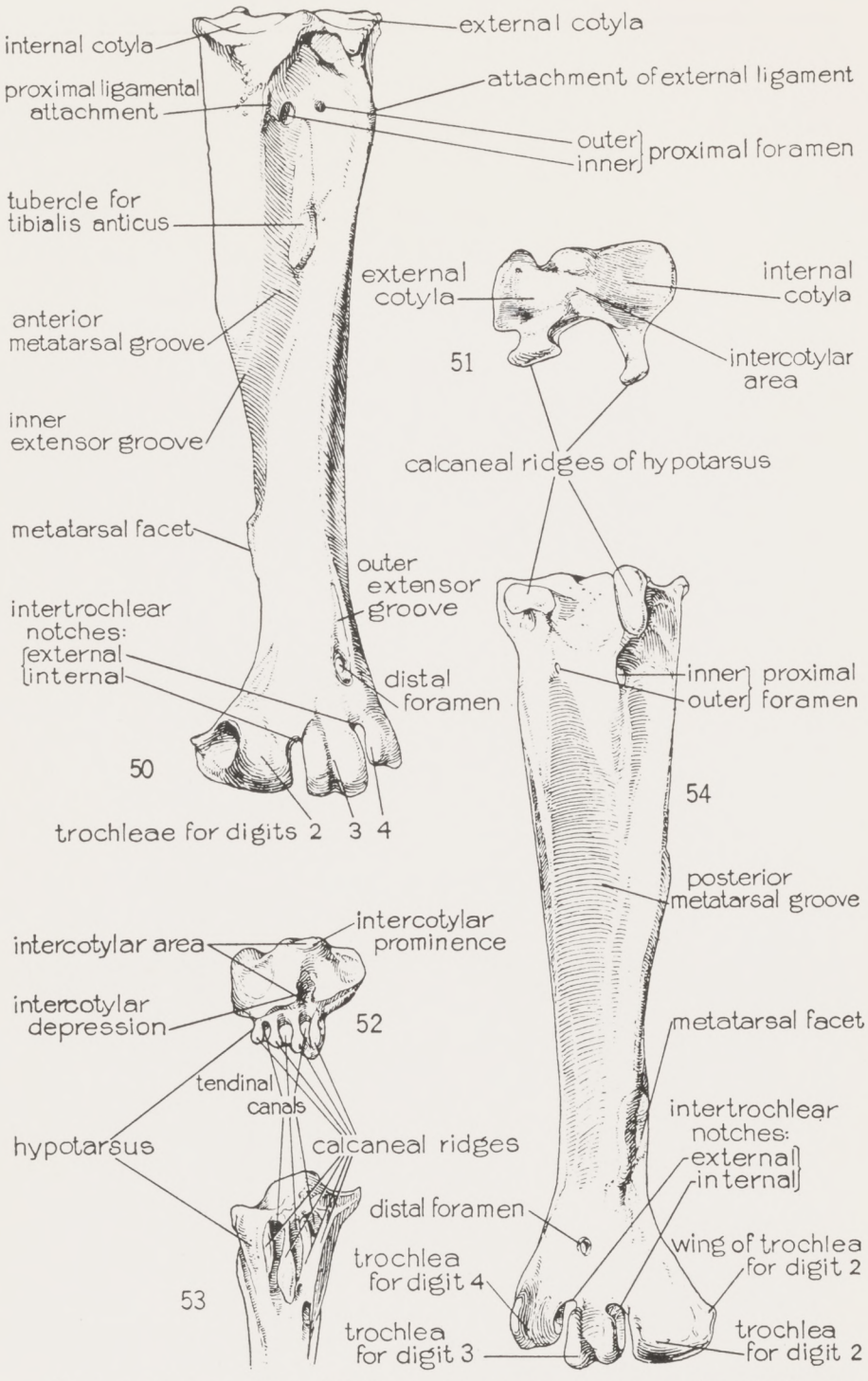
Pelvis of *Chen hyperboreus*. Fig. 34, lateral view; fig. 35, ventral view. × 1.



Figs. 36–42 and fig. 45, *Chen hyperboreus*; figs. 43–44, *Aquila chrysaetos*. Fig. 36, femur, posterior view; figs. 37–38, rib and sternal rib no. 4; figs. 39–42, digit 3 of pes; fig. 43, patella; fig. 44, metatarsal I; fig. 45, femur, anterior view. × 1.



Tibiotarsus and fibula of *Chen hyperboreus*. Fig. 46, posterior view; fig. 47, proximal end, proximal view; fig. 48, distal end, external view; fig. 49, anterior view. × 1.



Tarsometatarsus. Figs. 50, 51 and 54, *Aquila chrysaetos*; figs. 52–53, *Chen hyperboreus*. Fig. 50, anterior view; figs. 51 and 52, proximal end, proximal view; fig. 53, proximal end, posterior view; fig. 54, posterior view. × 1.